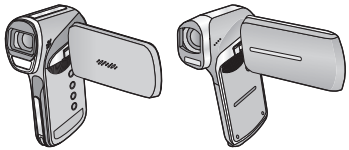
Panasonic

Operating Instructions

Dual Camera

Model No. **HX-WA2**
HX-DC2



Before use, please read these instructions completely.

VQT4F33

Information for Your Safety

■ About recording formats and compatibility of the unit

- The unit is an MP4 format (MPEG-4 AVC file standard) Dual Camera for recording high-definition motion pictures.
- AVCHD and MPEG2 motion pictures are different formats, and are not therefore supported by the unit.

■ Indemnity about recorded content

Panasonic does not accept any responsibility for damages directly or indirectly due to any type of problems that result in loss of recording or edited content, and does not guarantee any content if recording or editing does not work properly. Likewise, the above also applies in a case where any type of repair is made to the unit (including any other non-built-in memory related component).

■ Handling of built-in memory

This unit is equipped with the built-in memory. When using this component, pay attention to the following points.

Back up data periodically.

The built-in memory is temporary storage. In order to avoid erasing data due to static electricity, electromagnetic waves, breakage, and failures, back up the data to a PC or disc. (➜ 135)

- The status indicator (➜ 17, 22) illuminates in red while the SD card or built-in memory is being accessed (initialization, recording, playback, deleting etc.). Do not perform the following operations when the indicator illuminates. It may damage the built-in memory or cause a malfunction in the unit.
 - Turn the unit off (remove the battery)
 - Insert and remove the SD Card
 - Insert and remove the USB cable
 - Expose the unit to vibrations or shock
- About disposing of or giving away this unit. (➜ 175)

■ Cards that you can use with this unit

SD Memory Card, SDHC Memory Card and SDXC Memory Card

- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- Refer to page 32 for more details on SD cards.

■ For the purposes of these operating instructions

- SD Memory Card, SDHC Memory Card and SDXC Memory Card are referred to as the “SD card”.
- Functions that can be used for motion picture recording/motion picture playback are indicated by VIDEO in these operating instructions.
- Functions that can be used for still picture recording/still picture playback are indicated by PHOTO in these operating instructions.
- Functions that can be used for audio recording/audio playback are indicated by AUDIO in these operating instructions.
- Pages for reference are indicated by an arrow, for example: ➜ 00
- “File” is used to mean “scene”, “still picture” and “audio file”.

These operating instructions are designed for use with models HX-WA2 and HX-DC2. Pictures may be slightly different from the original.

- The illustrations used in these operating instructions show model HX-DC2, however, parts of the explanation refer to different models.
- Depending on the model, some functions are not available.
- Features may vary, so please read carefully.
- Not all models may be available depending on the region of purchase.

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(Important) About the Waterproof Performance of this unit [HX-WA2]

Waterproof Performance

This unit's waterproof rating complies with the "IPX8" rating. Provided the care and maintenance guidelines described in this document are strictly followed, this unit can operate underwater, to a depth not exceeding 3 m for a time not exceeding 60 minutes. *

This does not guarantee no destruction, no malfunction, or waterproofing in all conditions.

* This means that this unit can be used underwater for specified time in specified pressure in accordance with the handling method established by Panasonic.

■ Handling of this unit

- Waterproofing is not guaranteed if the unit is subject to an impact as a result of being hit or dropped etc. If an impact to this unit occurs, it should be inspected (subject to a fee) by a Panasonic's Service Centre to verify that the waterproofing is still effective.
- The waterproof performance may be degraded due to the strong water pressure when this unit is used deeper than 3 m underwater.
- When this unit is splashed with detergent, soap, hot spring, bath additive, sun oil, sun screen, chemical, etc., wipe it off immediately.
- Waterproof function of this unit is for sea water and fresh water only.
- Any malfunction caused by customer misuse, or mishandling will not be covered by the warranty.
- The inside of this unit is not waterproof. Water leakage will cause malfunction.
- Supplied accessories such as battery pack etc. are not waterproof. (excluding handstrap)
- Cards are not waterproof. Do not handle with a wet hand. Also, do not insert wet card into this unit.

- Do not leave this unit for a long period of time in places where temperature is very low (at ski resorts or at high altitude etc.) or very high (above 35 °C), inside a car under strong sunlight, close to a heater, on the beach, etc. Waterproof performance may be degraded.

- **Foreign objects may adhere to the inner side of the rear door (around the rubber seal or connecting terminals) when the rear door is opened or closed in places with sand or dust etc. This may result in the impairment of the waterproof performance if the rear door is closed with foreign objects adhered. Be extremely careful since it may result in malfunction etc.**
- **If any foreign object has adhered to the inner side of the rear door, remove with the lint-free cloth.**
- **If any liquid such as water droplets has adhered to this unit or inner side of the rear door, wipe off with a soft dry cloth. Do not open or close the rear door near the water, when underwater, using wet hands, or when this unit is wet. It may cause water leakage.**

■ When inner side of the lens is fogged (condensation)

It is not a malfunction or failure of this unit. It may be caused by the environment in which this unit is used.

- Be careful of condensation since it causes lens stains, fungus and unit malfunction.

What to do when inner side of the lens is fogged

- Turn off the unit and open the rear door in a place with constant ambient temperature, away from high temperatures, humidity, sand and dust. The fog will disappear naturally in about 2 hours with the rear door open when the temperature of this unit gets close to the ambient temperature.
- Contact Panasonic's Service Centre if the fogging does not disappear.

Conditions in which inner side of the lens may be fogged

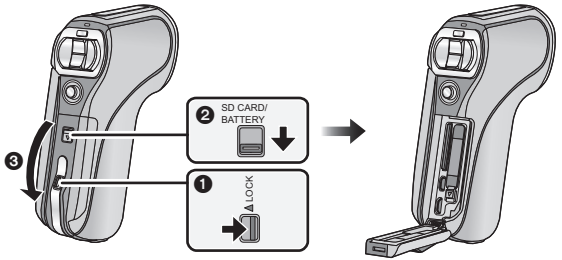
Condensation may occur and the inner side of the lens may be fogged when this unit is used in areas that undergo a significant change in temperature or in high humidity, such as the following:

- **When this unit is used underwater suddenly after being on a hot beach etc.**
- **When this unit is moved to a warm area from a cold area, such as at a ski resort or at high altitude**
- **When the rear door is opened in a high-humidity environment**

Check before using underwater

Do not open or close the rear door in places with sand and dust, close to water, or with wet hands. Sand or dust adhering may cause water leaks.

1 Open the rear door.



❶ Unlock the LOCK lever.
❷ Slide the open/close lever.
❸ Open the rear door.

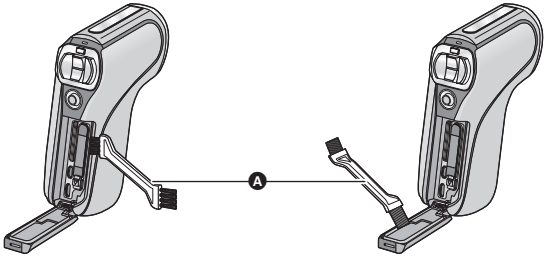
2 Check that there are no foreign objects on the inner side of the rear door.

- If there are any foreign objects, such as lint, hair, sand, etc., on the surrounding area, water will leak within a few seconds causing malfunction.

3 If there is foreign matter adhering to the unit, use the supplied brush to remove it.

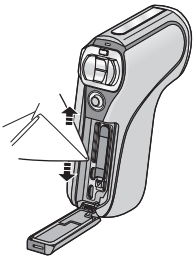
- Be extremely careful to remove any sand etc. that may adhere to the sides and corners of the rubber seal.
- Keep the brush out of reach of children to prevent swallowing.

- Use the brush end with the short (hard) bristles to remove larger foreign matter or damp sand from the unit.



Ⓐ Brush (supplied)

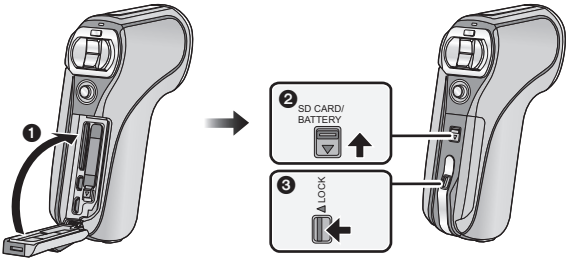
- Wipe it off with a dry soft cloth if there is any liquid. It may cause water leaks and malfunction if you use this unit with liquid adhered.



4 Check for cracks and deformation of the rubber seal on the rear door.

- The integrity of the rubber seals may decrease after about 1 year, with use and age. To avoid permanently damaging this unit the seals should be replaced once each year. Please contact Panasonic's Service Centre for related costs and other information.

5 Close the rear door securely.



❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.

- Lock securely to the points where the red portion of the open/close lever and LOCK lever are no longer visible.
- To prevent water seeping into this unit, be careful not to trap foreign objects such as liquids, sand, hair or dust etc.

■ About handling the brush

- Before use, check that foreign matter has not adhered to the brush.
- After use, remove any adhered foreign matter and clean in preparation for next use.

Using this unit underwater

- Use this unit underwater at a depth of down to 3 m with the water temperature between 0 °C and 35 °C.
- Do not use this unit at a depth of over 3 m.
- Do not use it in hot water over 35 °C (in the bath or hot spring).
- Do not use this unit underwater not longer than 60 minutes continuously.
- Do not open or close the rear door.
- Do not apply shock to this unit underwater. (Waterproof performance may not be maintained, and there is a chance of water leak.)
- Do not dive into the water holding this unit. Do not use this unit in a location where the water will splash strongly, such as rapid flow or waterfall. (Strong water pressure may be applied, and it may cause malfunction.)
- This unit will sink in the water. Take care not to drop this unit and lose it underwater by securely placing the strap around your wrist or similar measure.
- Attaching a tripod with a 5.5 mm screw or larger may open a hole in this unit through which water will leak.

Caring of this unit after using it underwater

Do not open or close the rear door until the sand and dust is removed by rinsing this unit with water.
Make sure to clean this unit after using it.

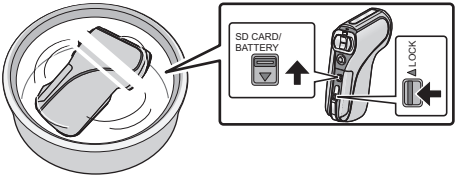
- Thoroughly wipe off any water droplets, sand, and saline matter on your hands, body, hair, etc.
- It is recommended to clean this unit indoors, avoiding places where water spray or sand may fall.

Do not leave this unit uncared for longer than 60 minutes after using it underwater.

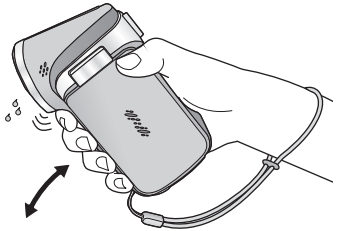
- Leaving this unit with foreign objects or saline matter on it may cause damage, discolouration, corrosion, unusual odour, or deterioration of the waterproof performance.

1 Rinse with water with the rear door closed.

- After use at the seaside or underwater, soak the unit in fresh water pooled in a shallow container for 10 minutes or less.

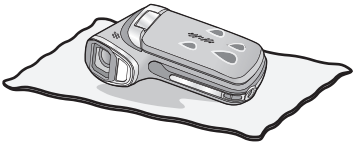


2 Drain water by holding this unit upside down and shaking it lightly a few times.



- After using this unit at the seaside or underwater, or after washing it, water will remain at the speaker site of this unit for a while and it may cause lower sound or sound distortion.
- Fasten the strap firmly to prevent this unit from dropping.

3 Wipe off water drops on this unit with a dry soft cloth and dry this unit in a shaded area which is well ventilated.



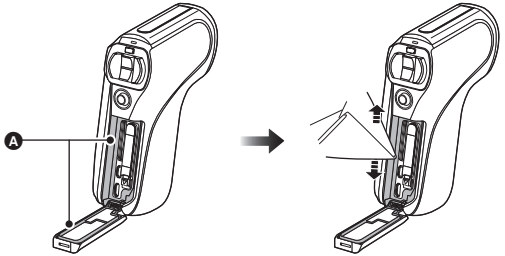
- Dry this unit by standing it on a dry cloth.
- Do not dry this unit with hot air from dryer or similar. It will deteriorate the waterproof performance or cause failure due to deformation.
- Do not use chemicals such as benzine, thinner, alcohol, or cleanser, or soap or detergents.

4 Confirm that there are no water droplets, open the rear door, and wipe off any water droplets or sand left inside using a soft dry cloth.

- Water droplets may adhere to the card when the rear door is opened without thoroughly drying. Also, water may accumulate in the gap around the card compartment, the battery compartment or the terminal connector. Be sure to wipe any water off with a soft dry cloth.
- The water droplets may seep into this unit when the rear door is closed while it is still wet, causing condensation or failure.

■ Wiping moisture from the unit

If there is moisture inside the rear door, wipe every crevice completely clear of moisture.
(This moisture is not due to exposure to water)



Ⓐ Moisture here

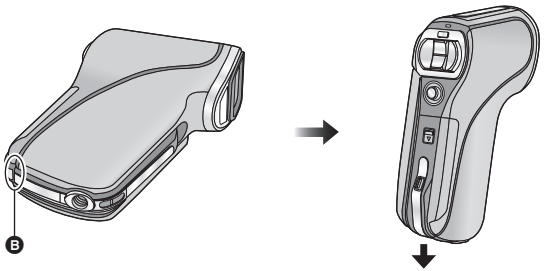
■ About the water draining design

This unit is designed so that water that entered the gaps around the zoom button etc. drains out. For this reason, bubbles may appear when the unit is immersed in water, but this is not a malfunction.

Draining water from the unit

Drainage holes are found on the bottom of the unit. Hold the unit vertically, as shown, to drain off the water.

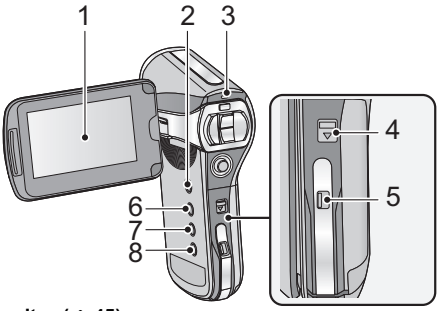
When draining, attach the hand strap to the unit and secure the hand strap to your wrist to prevent the unit from dropping.



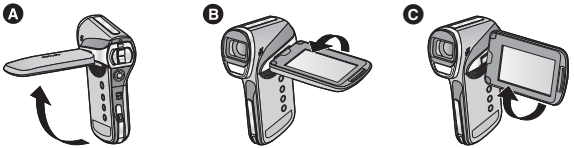
Ⓑ Drainage holes

Names and Functions of Main Parts

HX-WA2



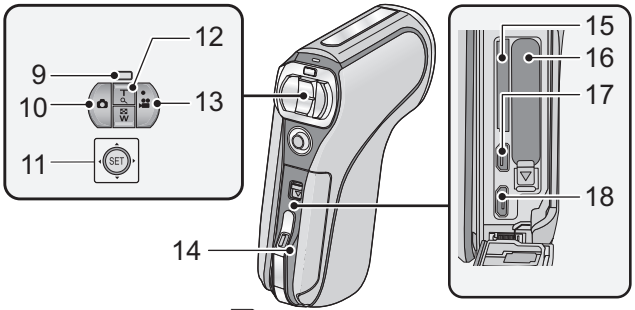
1 LCD monitor (➜ 45)



- It can open up to 90° A, rotate up to 180° B towards the lens or 105° C towards the opposite direction.

Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD monitor screen. However, this is not a malfunction and does not affect the recorded picture.

2 Power button [⏻/I] (➜ 38)
3 Status indicator (➜ 2, 27, 34, 177)
4 Open/close lever [SD CARD/BATTERY] (➜ 23, 34)
5 Lock lever [LOCK] (➜ 23, 34)
6 Menu button [MENU] (➜ 62)
7 REC/ ▶ button [REC/ ▶] (➜ 41)
8 Intelligent auto button [iA] (➜ 55)



9 Zoom range button [W/T] (➜ 72)

10 Photoshot button [] (➜ 49)

11 SET button [SET] (➜ 58, 62, 93, 102)

- Use the SET button to select the recording functions and playback operations, and to operate the menu screen.
- In these operating instructions, the SET button is denoted as shown below.
 Example:



or **Select using the SET button**

12 In Recording Mode: Zoom button [W/T] (➜ 71)
In Playback Mode: Volume button (➜ 60, 108)
Zoom button [W/T] (➜ 106)
Thumbnail display switch [/] (➜ 60)

13 Recording start/stop button [] (➜ 46)

14 Rear door (➜ 23, 34)

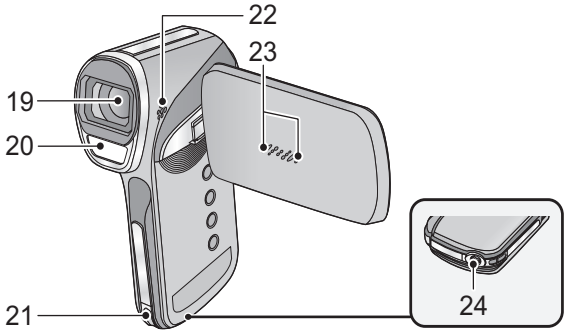
15 Card slot

16 Battery holder

17 HDMI micro connector (➜ 121, 128)

18 USB/AV connector (➜ 121, 133, 145)

- Use the USB cable/AV cable (only the supplied cable).

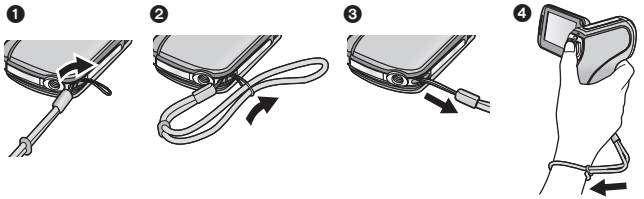


19 Lens

20 Built-in flash (➜ 86)

- The flash reaches high temperatures and may cause burns if touched. Please do not touch the flash.

21 Hand strap fixture



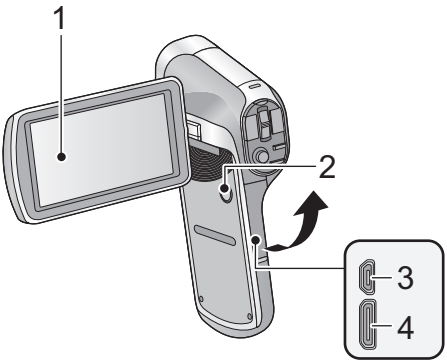
- Adjust the length after passing your arm through the hand strap.

22 Speaker

23 Internal stereo microphones

24 Tripod receptacle

- If you attach a tripod which has a 5.5 mm screw or larger, it may damage this unit.

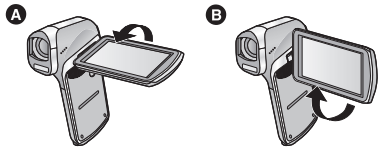


1 LCD monitor (➜ 45)



Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD monitor screen. However, this is not a malfunction and does not affect the recorded picture.

- It can open up to 90°.



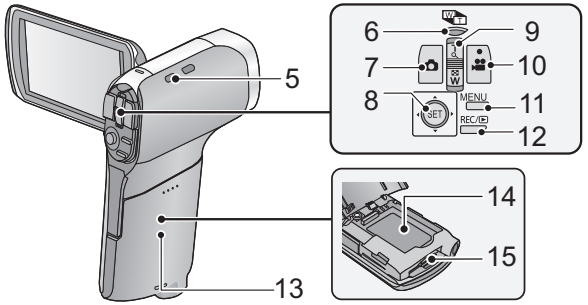
- It can rotate up to 180° A towards the lens or 105° B towards the opposite direction.

2 Power button [⏻/I] (➜ 38)

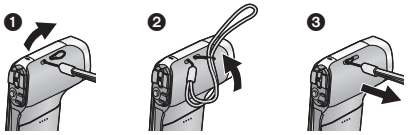
3 USB/AV connector (➜ 122, 133, 145)

- Use the USB cable/AV cable (only the supplied cable).

4 HDMI mini connector (➜ 122, 128)



5 Hand strap fixture



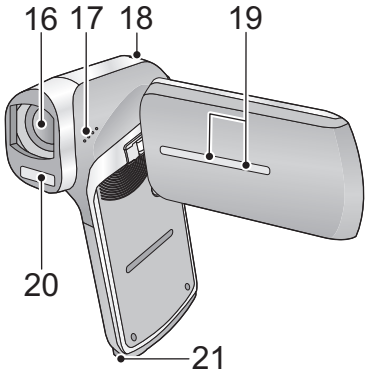
6 Zoom range button [W/T] (➜ 72)
7 Photoshot button [] (➜ 49)
8 SET button [SET] (➜ 58, 62, 93, 102)

- Use the SET button to select the recording functions and playback operations, and to operate the menu screen.
- In these operating instructions, the SET button is denoted as shown below. Example:



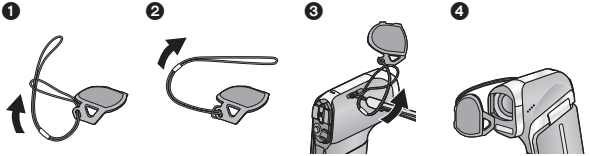
or **Select using the SET button**

9 In Recording Mode: Zoom lever [W/T] (➜ 71)
In Playback Mode: Volume lever (➜ 60, 108)
Zoom lever [W/T] (➜ 106)
Thumbnail display switch [/] (➜ 60)
10 Recording start/stop button [] (➜ 46)
11 Menu button [MENU] (➜ 62)
12 REC/ button [REC/] (➜ 41)
13 Battery/Card cover (➜ 25, 36)
14 Battery holder
15 Card slot



16 Lens

- When not using the unit, be sure to fit the lens cap to protect the lens.
- Keep the lens cap out of reach of children to prevent swallowing.



17 Speaker

18 Status indicator (➜ 2, 28, 36, 177)

19 Internal stereo microphones

20 Built-in flash (➜ 86)

- The flash reaches high temperatures and may cause burns if touched. Please do not touch the flash.

21 Tripod receptacle

- If you attach a tripod which has a 5.5 mm screw or larger, it may damage this unit.

Power supply

■ About batteries that you can use with this unit

HX-WA2

The battery that can be used with this unit is VW-VBX090.

HX-DC2

The battery that can be used with this unit is VW-VBX070.

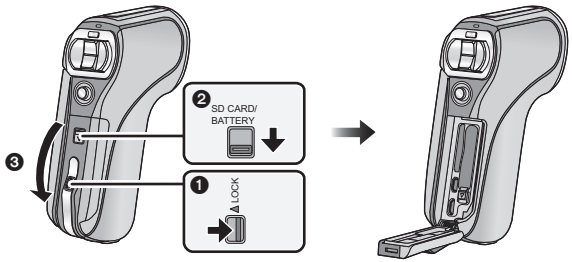
It has been found that counterfeit battery packs which look very similar to the genuine product are made available to purchase in some markets. Some of these battery packs are not adequately protected with internal protection to meet the requirements of appropriate safety standards. There is a possibility that these battery packs may lead to fire or explosion. Please be advised that we are not liable for any accident or failure occurring as a result of use of a counterfeit battery pack. To ensure that safe products are used we would recommend that a genuine Panasonic battery pack is used.

Inserting/removing the battery

HX-WA2

- **Press the power button to turn off the unit. (➜ 38)**

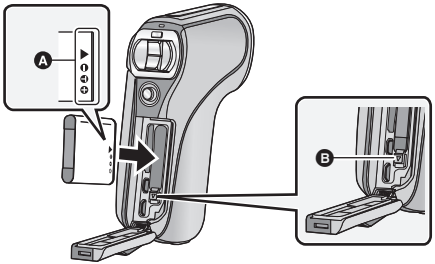
1 **Open the rear door.**



❶ Unlock the LOCK lever.
❷ Slide the open/close lever.
❸ Open the rear door.

2 (To insert the battery pack)

Confirm the orientation of the terminal markings and insert the battery.

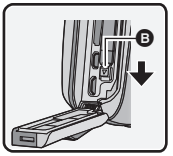


Ⓐ terminal markings

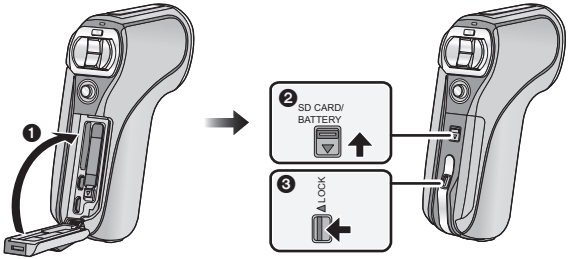
- Confirm that lever Ⓑ is locked on to the battery.
- It is possible to mistakenly insert the battery upside down, so be sure to check the orientation carefully.

(To remove the battery pack)

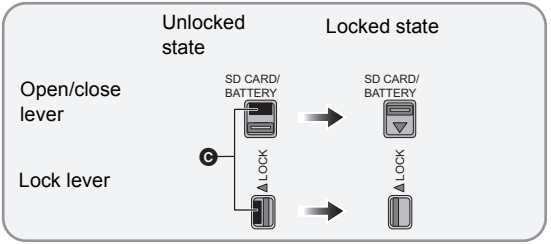
Push the lever Ⓑ toward the direction of arrow, and pull the battery straight out.



3 **Close the rear door.**



❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.

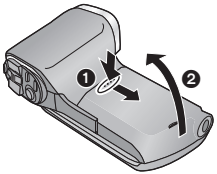


- Lock securely to the points where the red portion C of the open/close lever and LOCK lever are no longer visible.

HX-DC2

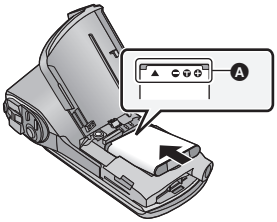
- **Press the power button to turn off the unit. (➜ 38)**

1 Open the battery/card cover.



❶ Slide while pushing the battery/ card cover.
❷ Open the battery/card cover.

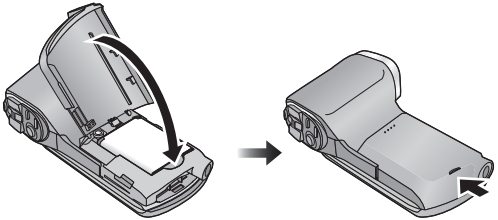
2 Insert the battery, taking care to match up the terminal markings.



A terminal markings

- It is possible to mistakenly insert the battery upside down, so be sure to check the orientation carefully.

3 Close the battery/card cover.

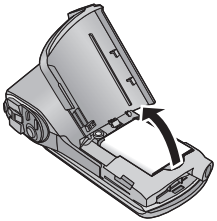


- Securely close it until it clicks.

Removing the battery

Press and hold down the power button to turn off the unit, then pull up and remove the battery.

- Always check that the LCD monitor and status indicator lamp are off.
- Keep the battery pack out of reach of children to prevent swallowing.



Charging the battery

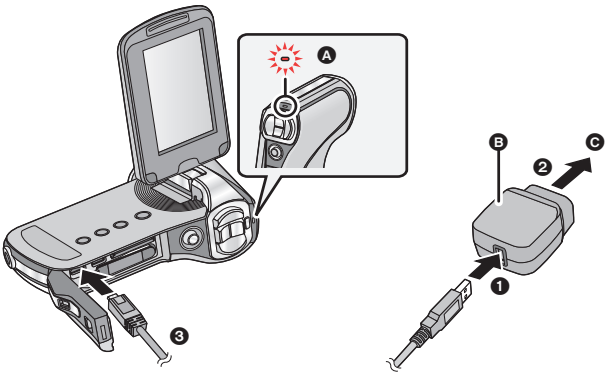
When this unit is purchased, the battery is not charged. Charge the battery fully before using this unit for the first time.

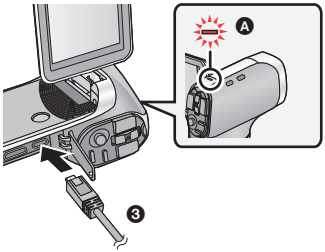
The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always “live” as long as the AC adaptor is connected to an electrical outlet.

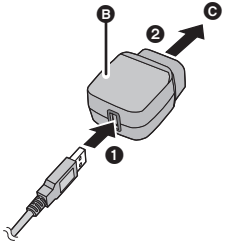
Important:

- **Be sure to use the supplied AC adaptor and USB cable. Do not use parts supplied with other equipment.**
- **The AC adaptor and USB cable are for use with this unit only. Do not use them with other equipment. Similarly, do not use AC adaptors and USB cables from other equipment with this unit.**
- **The battery is charged while the unit is off or in the sleep mode. (➜ 39)**
 The battery cannot be charged while the unit is recording or playing back.
- **It is recommended to charge the battery in a temperature between 10 °C and 30 °C. (The battery temperature should also be the same.)**

HX-WA2







Ⓐ Status indicator
Ⓑ AC adaptor
Ⓒ To the AC outlet

- Insert the plugs as far as they will go.

1 Connect the USB cable to the AC adaptor.

- Check that the plug portion of the AC adaptor is not loose or misaligned.

2 Plug the AC adaptor into the AC outlet.

3 Connect the USB cable to the unit.

- The status indicator flashes red with a period of approximately 2 seconds (approximately 1 second on, 1 second off), and charging begins. It will turn off when the charging is completed.

- Do not use any other AC adaptors except the supplied one.
- Do not use any other USB cables except the supplied one.
- We recommend using Panasonic batteries (➜ 29).
- If you use other batteries, we cannot guarantee the quality of this product.
- Do not heat or expose to flame.
- Do not leave the battery(ies) in a car exposed to direct sunlight for a long period of time with doors and windows closed.
- For charging by connecting to another device, refer to page 148.
- If the status indicator flashes at a particularly fast or slow rate, refer to page 177.

Charging and recording time

■ Charging/Recording time

- Temperature: 25 °C/humidity: 60%RH (When using AC adaptor)

HX-WA2				
Battery model number [Voltage/Capacity (minimum)]	**Charging time**	**Recording mode**	**Maximum continuous recordable time**	**Actual recordable time**
Supplied battery/ VW-VBX090 (optional) [3.7 V/880 mAh]	2 h 30 min	1080-60i	1 h 5 min	40 min
		1080-30p	1 h 15 min	40 min
		720-60p	1 h 10 min	40 min
		720-30p	1 h 20 min	45 min
		480-30p	1 h 50 min	50 min
		iFrame	1 h 25 min	45 min
			1 h 55 min	–

HX-DC2				
Battery model number [Voltage/Capacity (minimum)]	**Charging time**	**Recording mode**	**Maximum continuous recordable time**	**Actual recordable time**
Supplied battery/ VW-VBX070 (optional) [3.7 V/700 mAh]	2 h	1080-60i	50 min	30 min
		1080-30p	55 min	35 min
		720-60p	50 min	30 min
		720-30p	1 h 5 min	35 min
		480-30p	1 h 25 min	45 min
		iFrame	1 h 5 min	40 min
			1 h 30 min	–

- These times are approximations.

- **The indicated charging time is for when the battery has been discharged completely. Charging time and recordable time vary depending on the usage conditions such as high/low temperature.**

- The actual recordable time refers to the recordable time when repeatedly starting/stopping recording, turning the unit on/off, moving the zoom lever etc.
- The batteries heat up after use or charging. This is not a malfunction.

Battery capacity indication

- The display changes as the battery capacity reduces.
  (red)
 When the charge is low, is displayed at the centre of the LCD monitor.
- Due to the characteristics of the battery, it may not be possible to correctly display the charge remaining on the battery. For instance, at low temperatures, the  indicator may turn on earlier. Because the status of the charge remaining indicator changes according to the ambient temperature, conditions of use, etc., the indicator should be considered as an approximate guide.

■ Approximate operating time and number of recordable still pictures

HX-WA2		
Number of recordable pictures	Approx. 260 pictures	By CIPA standard
Recording time	Approx. 130 min	
Playback time	Approx. 255 min	

HX-DC2		
Number of recordable pictures	Approx. 210 pictures	By CIPA standard
Recording time	Approx. 105 min	
Playback time	Approx. 210 min	

Recording conditions by CIPA standard

- CIPA is an abbreviation of Camera & Imaging Products Association.
- Use of supplied battery
- Using a Panasonic SD Memory Card (2 GB)

Recording to a card

The unit can record motion pictures, still pictures or audio to an SD card or built-in memory. To record to an SD card, read the following.

This unit (an SDXC compatible device) is compatible with SD Memory Cards, SDHC Memory Cards and SDXC Memory Cards. When using an SDHC Memory Card/SDXC Memory Card with other equipment, check the equipment is compatible with these Memory Cards.

Cards that you can use with this unit

Use SD cards conforming to Class 4 or higher of the SD Speed Class Rating* for motion picture recording.

Card type	Capacity
SD Memory Card	512 MB/1 GB/2 GB
SDHC Memory Card	4 GB/6 GB/8 GB/12 GB/16 GB/ 24 GB/32 GB
SDXC Memory Card	48 GB/64 GB

* SD Speed Class Rating is the speed standard regarding continuous writing. Check via the label on the card, etc.

e.g.:



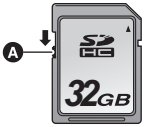
- Please confirm the latest information about SD Memory Cards/SDHC Memory Cards/SDXC Memory Cards that can be used for motion picture recording on the following website.

http://panasonic.jp/support/global/cs/e_cam

(This website is in English only.)

- To use the Eye-Fi transfer feature (➜ 157), an Eye-Fi X2 series SD card is required.
- Operation of SD Memory Cards with a capacity of 256 MB or less is not guaranteed.

- 4 GB or more Memory Cards that do not have the SDHC logo or 48 GB or more Memory Cards that do not have the SDXC logo are not based on SD Memory Card Specifications.
- The operation of Memory cards exceeding 64 GB cannot be guaranteed.
- When the write-protect switch Ⓐ on SD card is locked, no recording, deletion or editing will be possible on the card.
- Keep the Memory Card out of reach of children to prevent swallowing.



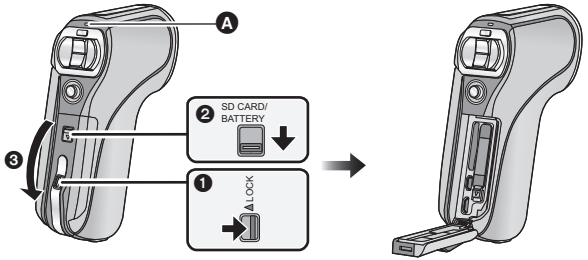
Inserting/removing an SD card

When using an SD card not from Panasonic, or one previously used on other equipment, for the first time on this unit, format the SD card. (➜ 66) When the SD card is formatted, all of the recorded data is deleted. Once the data is deleted, it cannot be restored.

HX-WA2

Caution:
Check that the status indicator has gone off.

1 Open the rear door.

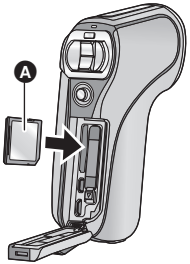


Status indicator A

- When this unit is accessing the SD card or built-in memory, the status indicator lights up red.

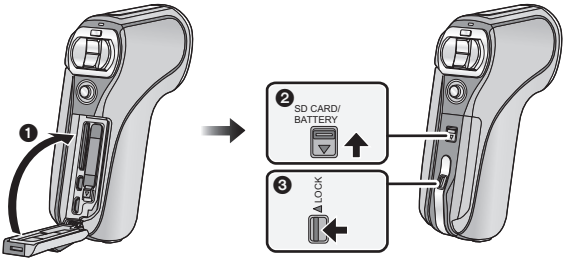
1. Unlock the LOCK lever.
2. Slide the open/close lever.
3. Open the rear door.

2 Insert (remove) the SD card into (from) the card slot.



- Face the label side Ⓐ in the direction shown in the illustration and press it straight in as far as it will go.
- Press the centre of the SD card and then pull it straight out.

3 Close the rear door.



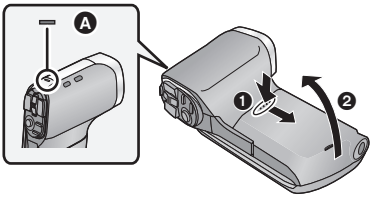
❶ Close the rear door.
❷ Slide the open/close lever.
❸ Lock the LOCK lever.

- Lock securely to the points where the red portion of the open/close lever and LOCK lever are no longer visible.

HX-DC2

Caution:
Check that the status indicator has gone off.

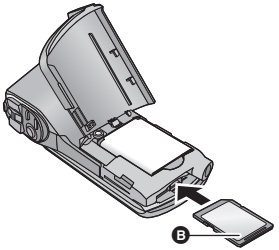
1 Open the battery/card cover.



Status indicator A

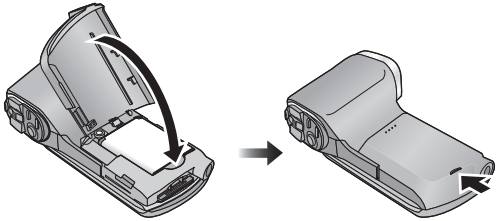
- When this unit is accessing the SD card or built-in memory, the status indicator lights up red.

2 Insert (remove) the SD card into (from) the card slot.



- Face the label side B in the direction shown in the illustration and press it straight in as far as it will go.
- Press the centre of the SD card and then pull it straight out.

3 Close the battery/card cover.



- Securely close it until it clicks.

- Do not touch the terminals on the back of the SD card.
- Do not shock, bend, or drop the SD card.
- Electrical noise, static electricity or the failure of this unit or the SD card may damage or erase the data stored on the SD card.
- When the status indicator (➜ 17, 22) illuminates in red, do not:
 - Remove the SD card
 - Turn the unit off
 - Insert and remove the USB cable
 - Expose the unit to vibrations or shock

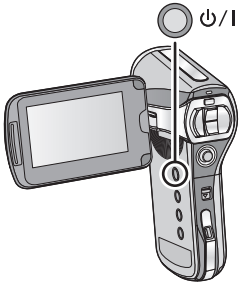
 Performing the above while the indicator is on may result in damage to data/SD card or this unit.
- Do not expose the terminals of the SD card to water, dirt or dust.
- Do not place SD cards in the following areas:
 - In direct sunlight
 - In very dusty or humid areas
 - Near a heater
 - Locations susceptible to significant difference in temperature (condensation can occur.)
 - Where static electricity or electromagnetic waves occur
- To protect SD cards, return them to their cases when you are not using them.
- About disposing of or giving away the SD card. (➜ 178)

Turning the unit on/off

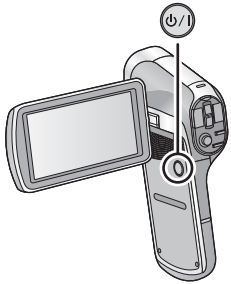
Open the LCD monitor and press the power button to turn on the unit.

The LCD monitor turns on.

HX-WA2



HX-DC2



To turn off the unit

Hold down the power button until the LCD monitor goes off.

- Pressing the power button for a short time sends the unit into sleep mode. (➜ 39)

About standby mode

When the LCD monitor is closed while the unit is on, the unit enters standby mode which consumes very little power.

In standby mode, opening the LCD monitor turns on the unit, making the unit ready for recording immediately. Use standby mode when you stop using the unit but intend to use it again after a short time.

■ **Standby mode**



■ **To turn on the unit**



- The unit does not go into standby mode when you close the LCD monitor during motion picture recording or audio recording.
- If you open the LCD monitor when in standby mode, the unit enters recording mode.
- In the following cases, opening the LCD monitor does not turn on the unit. Press the power button to turn on the unit.
 - When the unit is originally purchased
 - When you have turned off the unit using the power button

About economy function

To prevent battery consumption due to forgetting to turn the unit off etc., the economy mode function works to send the unit into sleep mode if the unit has been on for approximately 5 minutes (default setting) without an operation being performed. (The LCD monitor switches off, and the status indicator flashes green)

- When the unit is in sleep mode, you can turn on the unit by pressing any of the buttons on the unit. (The mode prior to entering sleep mode is restored.)
- The time until the unit goes into sleep mode can be changed. (➜ 65)
- Approximately 1 hour after entering sleep mode, the unit enters standby mode.

About the high temperature warning icon

If the battery temperature or unit internal temperature (excluding battery) rises, the high temperature warning icon will provide warning as indicated below.

Battery/unit internal temperature	Screen display	Unit operation
	(ON)	Although it is possible to record/play back, please stop using the unit as soon as possible and turn off the unit.
	(ON)	Motion picture recording is no longer possible. (If you are recording a motion picture, the recording stops.) Please turn off the unit.
	(Flashing)	After the flashing of the , the unit turns off automatically. The unit does not turn on when the temperature drops. (flashes.) Wait for the temperature to drop before using the unit again.

A High temperature

- When you turn off the unit while the temperature is high (is displayed), you will not be able to turn on the unit again until the temperature lowers. (will flash.)

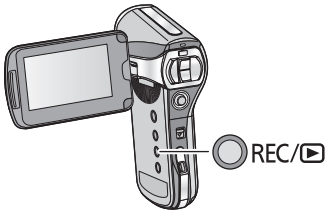
Selecting a mode

Change the mode to recording or playback.

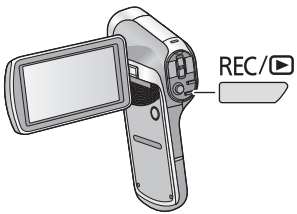
Press the REC/ ▶ button.

- Each press of the REC/ ▶ button changes the mode.

HX-WA2



HX-DC2



Recording Mode (➜ 46, 49, 53)	For recording motion pictures, still pictures and audio
Playback Mode (➜ 58, 102)	For playing back motion pictures, still pictures and audio

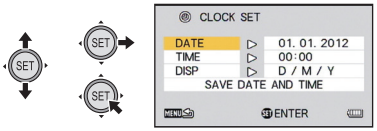
Setting date and time

If the screen to set the date and time appears when you turn on the unit, skip to step 2 and follow the steps to set the date and time.

1 Select the menu. (➜ 62)

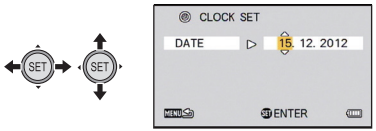
[MENU]: [SETUP] → [CLOCK SET]

2 Select an item (DATE/TIME/DISP) using the SET button and then tilt the SET button to the right or press the SET button.



3 (When [DATE] or [TIME] is selected)
Tilt the SET button to the left or right to select the desired item and then up and down to set the numerical values.

e.g.: When [DATE] is selected

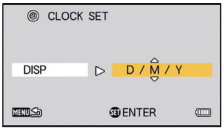


- The year can be set between 2000 and 2039.

(When [DISP] is selected)

Select the year/month/day display method using the SET button.





4 Press the SET button.

5 Select [SAVE DATE AND TIME] using the SET button and then press the SET button.

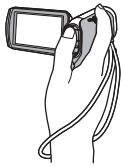
- To return to the recording screen or playback screen, press the MENU button.

- **At the time of purchase, the [CLOCK SET] is not set.**
- If the date and time have not been set or the built-in clock battery has run down, the screen display and recording day/month/year information will appear as follows.
 Recording screen display: --.--.---- -:--
 Recording day/month/year information: 01.01.2012 0:00
- To charge the built-in clock battery, install a fully charged battery in the unit. If you leave the battery for approximately 2 days, the time settings will be stored for approximately 7 days. (The charging continues even when the unit is turned off)
- HX-WA2
 [Before using the unit under water] and [Maintenance after use in water] are displayed when setting date and time for the first time after purchase. Please check beforehand to maintain the waterproof performance. Press the MENU button to exit the message screen.

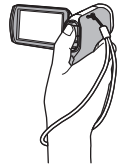
Before recording

■ Basic camera positioning

Example 1:
Grip the unit with the forefinger of your right hand above the lens and the middle finger to little finger surrounding the body.



Example 2:
Grip the unit with the forefinger to little finger of your right hand surrounding the body.



- To avoid dropping the unit, be sure to attach a handstrap.
- When recording, make sure your footing is stable and there is no danger of colliding with another person or object.
- When you are outdoors, record pictures with the sunlight behind you. If the subject is backlit, it will become dark in the recording.
- Keep your arms near your body and separate your legs for better balance.
- When performing zoom operations, you can prevent the jitter associated with zoom operations by placing your other hand on the LCD monitor to stabilise the unit.
- Ensure that the lens and flash are not obstructed by your fingers or the handstrap. Also, ensure that your hand is not blocking the microphones on the LCD monitor.

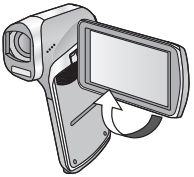
■ Basic motion picture recording

- The unit should normally be held steady when recording.
- If you move the unit when recording, do so slowly, maintaining a constant speed.
- The zoom operation is useful for recording subjects you cannot get close to, but overuse of zoom in and zoom out can make the resulting motion picture less enjoyable to watch.

■ Recording yourself

Rotate the LCD monitor towards the lens side.

- The image is horizontally flipped as if you see a mirror image. (However the image recorded is the same as a normal recording.)



■ If the surface of the unit gets hot

Due to the characteristics of the unit, the outer surface may become warm during use, but this does not indicate a malfunction.

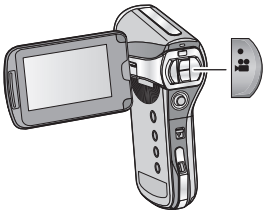
- If the unit starts to feel uncomfortably hot during use, you might temporarily discontinue use until it cools down, or try holding it in your other hand for a while. Please use a tripod or other support when using the unit for a long time.

Recording motion pictures

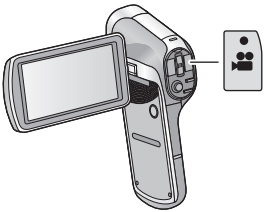
- HX-DC2

 Before turning on the unit, remove the lens cap.
- Motion pictures are recorded to the SD card if one is inserted. If no SD card is inserted, the motion pictures are recorded to the built-in memory.

HX-WA2

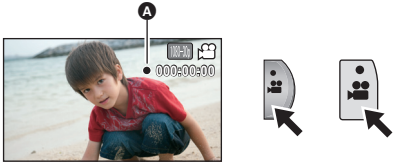


HX-DC2



1 **Open the LCD monitor.**

2 **Press the recording start/stop button to start recording.**



A When you begin recording, ● appears.

3 **Press the recording start/stop button again to pause recording.**

■ About the screen indications in the motion picture recording



1080-30p	**Recording mode**
	Motion picture operation indicator (➜ 162)
● (Red)	**During motion picture recording** When the remaining recordable time drops to approx. 30 seconds or less, ● flashes.
000:00:15	**During recording:** **Recording time elapsed** Each time the unit is put into recording pause, the counter display will be reset to 000:00:00. **During recording standby:** **Approximate remaining recordable time**

- The images recorded between pressing the recording start/stop button to start recording and pressing it again to pause recording become one scene.
- If the file size exceeds 4 GB during recording, the unit saves the file and saves the continuation in a new file. (A new file is created automatically every 4 GB (➜ 183))
- While recording is in progress, the recording will not stop even if the LCD monitor is closed.
- Please refer to page 182 for details about approximate recordable time.

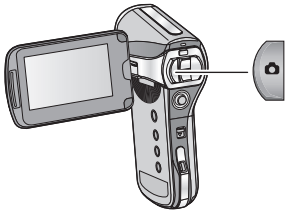
About the compatibility of the recorded motion pictures

- They are not compatible with devices other than those that support MP4. Images cannot be played with equipment that does not support MP4. Confirm that your equipment supports MP4 by referring to the operating instructions.
- There are some cases where the recorded motion pictures cannot be played back, even if the device supports MP4. In such a case, play back on this unit instead.

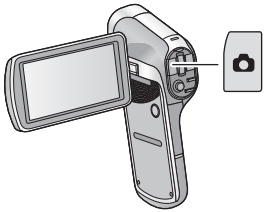
Recording still pictures

- HX-DC2
 Before turning on the unit, remove the lens cap.
- Still pictures are recorded to SD card if one is inserted. If no SD card is inserted, the still pictures are recorded to the built-in memory.

HX-WA2

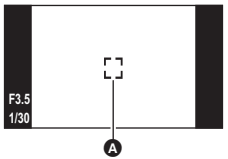


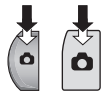
HX-DC2



1 **Open the LCD monitor.**

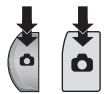
2 (For auto focus only)
Press the button halfway.





A Focus area (area inside brackets)

3 **Press the button fully.**



- If you continue to hold down the button, you can check the recorded image on the LCD monitor.

■ About the recording standby screen display

The field of view of the image displayed on the LCD monitor differs for motion picture recording and still picture recording. At time of purchase, the recording standby screen displays video view. Press the button halfway to change to photo view.

- When [PHOTO VIEW] is set to (ON), you can change the recording standby screen display to the photo view. (➜ 97)

Video view



Photo view



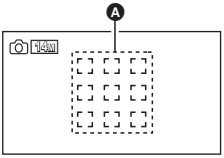
Ⓐ Video recording area

■ About the screen indications in the still picture recording



	Still picture operation indicator (➜ 160)
14M	Size of still pictures (➜ 82)
3000	Remaining number of still pictures
	Flash (➜ 86)
ISO400	ISO (➜ 91)
F3.5	Iris value
1/30	Shutter speed
	Image stabiliser for still picture (➜ 74)

■ About the focusing area



- When [FOCUS MODE] (➜ 88) is set to [9-PT AUTOFOCUS], [] (focusing area A) is displayed at the position where focus is achieved.
 The unit automatically determines the position where focus is achieved from nine focus points within the recording area. If the focusing area doesn't appear in a desired position, try adjusting the camera angle etc., and focus again.
 When focus is achieved over a wide range at the centre of the screen, a large focusing area is displayed.
- When [FOCUS MODE] (➜ 88) is set to [SPOT FOCUS], the unit can focus on the subject in the centre of the recording area.

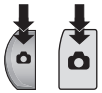
- When the risk of jitter increases due to a slower shutter speed while recording still picture, (camera shake icon) will appear on the LCD monitor. When this occurs, attach the unit to a tripod to prevent jitter while recording or set [FLASH] to ϟA (AUTO). (➜ 86)
- When recording in a dark environment, writing to the card may take time.
- To print a picture, save the picture to the SD card (➜ 131) and print using a PC or a printer.
- The edges of still pictures recorded on this unit with a 16:9 aspect ratio may be cut at printing. Check the printer or photo studio before printing.
- Please refer to page 184 for details about the number of recordable pictures.

About recording still pictures during motion picture recording and audio recording

You can record still pictures while recording a motion picture or while recording audio. (simultaneous recording)

Press the button fully (press to the bottom) to take the picture.

- When the recordable time drops to approximately 30 seconds or less, the unit can no longer record still pictures while recording a motion picture or while recording audio.



■ About picture size

When you record a still picture while recording a motion picture or audio, the picture size will depend on the Recording mode. (➜ 81)

Recording mode	Picture size		Aspect ratio
1080-60i / 1080-30p	2M	1920×1080	16:9
720-60p / 720-30p	0.9M	1280×720	16:9
480-30p / 🎤	0.3M	640×480	4:3

- Still pictures cannot be recorded during iFrame recording.
- Burst recording is not possible.
- The Flash (➜ 86) and Image stabiliser for still picture (➜ 74) are disabled.

Recording audio

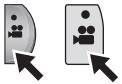
- Audio is recorded to the SD card if one is inserted. If no SD card is inserted, the audio is recorded to the built-in memory.

1 **Open the LCD monitor.**

2 **Select the menu. (➜ 62)**

[MENU]: → [REC MODE] → [(VOICE RECORD)]

3 **Start recording by pressing the recording start/stop button.**



4 **Press the recording start/stop button again to stop recording.**

■ About the screen display for audio recording



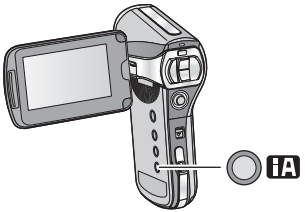
	Audio operation indicator (➜ 161)
● (Red)	**During audio recording** When the remaining recordable time drops to approx. 30 seconds or less, ● flashes.
000:00:15	**During audio recording:** **Recording time elapsed** Every time recording is stopped, the indicator returns to 000:00:00. **During audio recording standby:** **Approximate remaining recordable time**

- When the recording time exceeds approximately 5 hours, the file is saved and the audio recording ends.

Intelligent Auto Mode

The modes (appropriate for the condition) are set just by pointing the unit to what you want to record.

HX-WA2



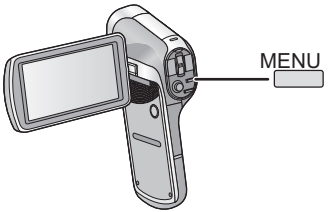
Press the iA button to switch to Intelligent Auto Mode.

- Please refer to page 99 for details about Manual Mode.

HX-DC2

Select the menu. (➜ 62)

[MENU]: → [INTELLIGENT AUTO] → [iA (ON)]



- Please refer to page 99 for details about Manual Mode.

Mode		Effect
	Portrait	Faces are detected and focused automatically, and the brightness is adjusted so it is recorded clearly.
	Scenery	The whole landscape will be recorded vividly without whiting out the background sky, which may be very bright.
*1	**Spotlight**	Very bright object is recorded clearly.
*1	**Low light**	It can record very clearly even in a dark room or twilight.
*2	**Night portrait**	A person and the background are recorded with near real-life brightness.
*2	**Night scenery**	You can record night scenery vividly by slowing the shutter speed.
*2	**Macro**	This allows recording while going near to the object of recording.
*1 *2	**Normal**	Adjusts the contrast and gives a clean image when not using the above modes.

*1 Mode for motion picture recording only

*2 Mode for still picture recording only

- Depending on the recording conditions, the unit may not enter the desired mode.
- We recommend using a tripod in Night portrait/Night scenery/Low light.
- Faces cannot be detected depending on the recording conditions, such as when faces are of certain sizes or at certain tilts or when digital zoom is used.

■ Intelligent Auto Mode

When switching to Intelligent Auto Mode, the Auto White Balance and Auto Focus operate and automatically adjust the colour balance and focusing.

Depending on the brightness of the subject etc., the aperture and shutter speed are automatically adjusted for an optimum brightness.

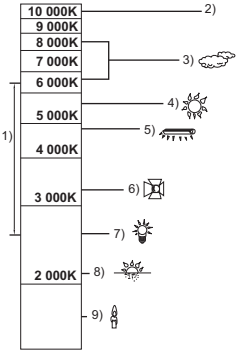
- Colour balance and focus may not be adjusted automatically depending on light sources or scenes. If so, manually adjust these settings. (➜ 99, 101)

Automatic White Balance

The illustration shows the range over which Automatic White Balance functions.

1) The effective range of Automatic White Balance adjustment on this unit
2) Blue sky
3) Cloudy sky (rain)
4) Sunlight
5) White fluorescent lamp
6) Halogen light bulb
7) Incandescent light bulb
8) Sunrise or sunset
9) Candlelight

If the Automatic White Balance is not functioning normally, adjust the White Balance manually. (➜ 99)



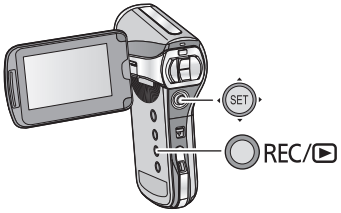
Auto Focus

The unit focuses automatically.

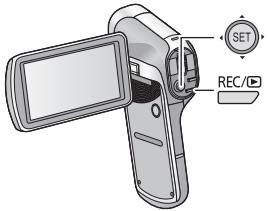
- Auto Focus does not work correctly in the following situations. Record pictures in the Manual Focus Mode. (➜ 101)
 - Recording distant and close-up objects at the same time
 - Recording a subject behind dirty or dusty window
 - Recording a subject that is surrounded by objects with glossy surfaces or by highly reflective objects

Motion picture/Still picture/Audio playback

HX-WA2



HX-DC2



1 Press the REC/ button to change to playback mode.

2 Select the file to play back using the SET button and press the SET button.

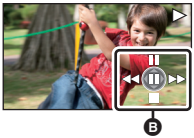
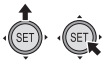
Thumbnail display



A The information for the file in the yellow frame is displayed.

- Tilt and hold the SET button up or down to display the next (or previous) page.

3 Play back using the SET button.

Motion picture/audio playback		
		Playback/Pause
		Rewind playback
		Fast forward playback
		Stops the playback and shows the thumbnails.

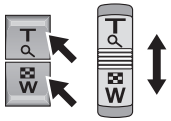
Ⓑ **Operation icon***

* If the operation icon disappears, perform a SET button operation to display it.

Still picture playback		
		Deletes still picture (➜ 117)
		Displays previous file
		Displays next file
		Stops playback and returns to thumbnail display

■ Change the thumbnail display

While the thumbnail is displayed, the thumbnail display changes in the following order if the zoom button (HX-WA2) or zoom lever (HX-DC2) is operated to Q side or ▦ side.
21 files ⟷ 8 files ⟷ 1 file

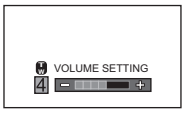


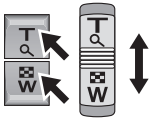
- If you operate the zoom button (HX-WA2) or zoom lever (HX-DC2) to the ▦ side from the 21 files display mode, the unit goes to the playback folder selection screen. (➜ 69)
- If you operate the zoom button (HX-WA2) or zoom lever (HX-DC2) to the Q side with a still picture in a single file display state, the unit enters playback zoom (➜ 106).
- When the SET button is tilted to the right (left) during single file display, the next (previous) file is displayed.
- When following operations are performed, 8 file display is restored.
 - If you turn the unit off
 - If you change the recording mode
 - If you display the menu screen

■ Speaker volume adjustment

To adjust the speaker volume during motion picture or audio playback, operate the volume button (HX-WA2) or volume lever (HX-DC2) during playback.

Towards Q :
Increases the volume
Towards ▦ :
Decreases the volume





- When a playback of a motion picture file or audio file ends, the thumbnail display is restored.
- Except in normal motion picture/audio playback, sound is not emitted.
- The elapsed time for motion picture playback indication will be reset to 00:00:00 for each scene.
- The elapsed time for audio playback indication will be reset to 000:00:00 for each file.

- On the thumbnail screen for continuously recorded files (➜ 183) exceeding 4 GB, (8 file display) or (1 file display) is displayed.
- Closing the LCD monitor stops playback and sends the unit into standby mode. (➜ 38)

Motion picture compatibility

- The unit conforms to the MP4 format (MPEG-4 AVC file standard).
- Motion pictures recorded on other MP4-compatible equipment may not play back normally or may not play back at all on this unit. Similarly, motion pictures recorded on this unit may not play back normally or may not play back at all on other MP4-compatible equipment.

Still picture compatibility

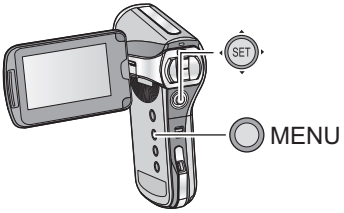
- This unit conforms to the universal DCF (Design rule for Camera File system) standard and Exif (Exchangeable Image File Format) stipulated by JEITA (Japan Electronics and Information Technology Industries Association). Files which do not conform to the DCF standard cannot be played back.
- The file format of still pictures supported by this unit is JPEG. (Not all JPEG formatted files will be played back.)
- This unit may degrade or not play back still pictures recorded or created on other products and other products may degrade or not play back still pictures recorded on this unit.

Audio compatibility

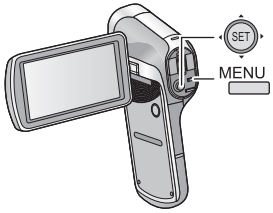
- The unit conforms to the AAC file standard.
- This unit may degrade or not play back audio recorded or created on other products and other products may degrade or not play back audio recorded on this unit.

Using the menu screen

HX-WA2



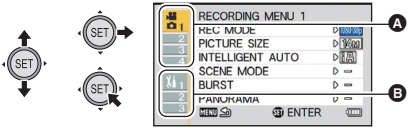
HX-DC2



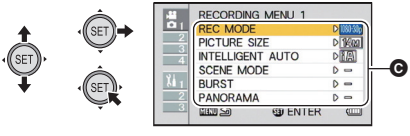
1 **Press the MENU button.** MENU/MENU

2 **Tilt the SET button to the left.** ←SET

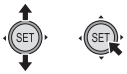
3 **Select tab Ⓐ or option tab Ⓑ using the SET button, and press down the right side of the SET button or press the SET button.**

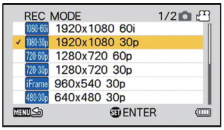


4 **Select from menu items Ⓒ using the SET button, and tilt the SET button to the right, or press the SET button.**



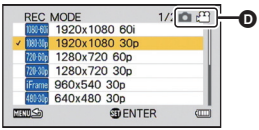
5 Select the setting content using the SET button and press the SET button to set.





■ About applicable mode indicator

In the recording menu, the recording mode that reflects the currently displayed setting is displayed.



D Applicable mode indicator

: Setting is applied to still picture and motion picture recording.

: Setting is applied to still picture recording.

: Setting is applied to motion picture recording.

To get back to the previous screen

Press the MENU button.

To end the menu setting

Press the MENU button several times.

Using Option Menu

- **The displayed items change depending on the mode setting (recording mode, playback mode).**

Select the menu.

[MENU]: [1], [2] or [3] → desired setting

[1] OPTION MENU 1

[CLOCK SET]

Please refer to page 42.

[ALERT SOUND]

Set the type and volume of operation sounds for the unit.

[TURN ON/OFF]:
Sets the sound emitted when the unit is turned on/off. ([ON]/[OFF])

[RECORD BEEP]:
Sets the sound emitted when recording is started and stopped. ([ON]/[OFF])

[SHUTTER]:
Sets the sound emitted when the button is pressed. ([OFF]/[A]/[B]/[C]/[D])

[KEY SW]:
Sets the sound emitted when the buttons (SET button, MENU button, etc.) are pressed. ([OFF]/[A]/[B]/[C]/[D])

[OPERATION VOL]:
Sets the volume of the operation sounds. ([1] to [7])

[ALL OFF]/[OPERATION SOUNDS ON]:
Sets all operation sounds on/off

[DISPLAY]

Turns screen display [ON] (display) or [OFF] (not-display).

[ECONOMY]

Sets the time until the unit goes into sleep mode to save on battery consumption. (➜ 39)

[BATTERY:REC]:	Sets the time for which the unit is in the recording mode using the battery, before it goes into sleep mode. ([1 min]/[3 min]/[5 min]/[10 min])
[BATTERY:PLAY]:	Sets the time for which the unit is in the playback mode using the battery, before going into sleep mode. ([1 min]/[3 min]/[5 min]/[10 min]/[30 min])
[AC:REC/PLAY]:	Sets the time for which the unit is in the recording/playback mode using the AC adaptor, before going into sleep mode. ([1 min]/[3 min]/[5 min]/[10 min]/[30 min]/[60 min])

[BRIGHTNESS]

Sets the brightness of the LCD monitor of the unit (7 steps).

OPTION MENU 2

[LANGUAGE]

You can select the language on the screen display and the menu screen.

[TV OUTPUT]

[TV SYSTEM]:	Please refer to page 126.
[TV ASPECT]:	Please refer to page 125.
[HDMI]:	Please refer to page 126.
[VIERA Link]:	Please refer to page 127.

[INITIAL SET]

Returns the menu to the settings at the time of purchase.

- Settings for [CLOCK SET], [LANGUAGE] and the double range zoom will not be changed.

[FORMAT]

Please be aware that if a medium is formatted, then all the data recorded on the medium will be erased and cannot be restored. Back up important data on a PC, disc etc. (➜ 135)

- To format the built-in memory, perform a format with the SD card removed.

[FORMAT]:
A logical format is performed on the SD card or built-in memory.

[DELETE DATA]:
A physical format is performed on the SD card or built-in memory.

Select [FORMAT] or [DELETE DATA] using the SET button and press the SET button.

- When selecting [DELETE DATA], please use the AC adaptor. When using the battery, [DELETE DATA] cannot be selected.

- Select [DELETE DATA] and perform a physical formatting of the SD card when the SD card is to be disposed/ transferred. (➜ 178)
- Select [DELETE DATA] and perform a physical formatting of the built-in memory when this unit is to be disposed/ transferred. (➜ 175)

- Do not turn this unit off or remove the SD card, while formatting. Do not expose the unit to vibrations or shock.

Use this unit to format media.
Formatting built-in memory is only available with this unit.
Do not format an SD card using any other equipment such as a PC. The card may not be used on this unit.

OPTION MENU 3

[REC FOLDER]

Creates or selects a recording folder (folder containing a recorded file). (SD card recording only)

- **Insert the SD card.**
- **Set to Recording mode. (➜ 41)**

1 Select [REC FOLDER] using the SET button and press the SET button.

2 (When creating a folder)
Select [CREATE NEW FOLDER] using the SET button and press the SET button.
- The created folder is set as the recording folder.

(When selecting a folder)
Select the folder number of the desired folder using the SET button and press the SET button.





- You cannot select folders which have been created on other equipment or folders which already contain the maximum number of files.

[PLAYBACK FOLDER]

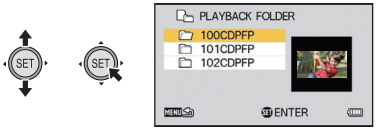
When the SD card or built-in memory contains multiple folders, you can select a folder for playback.

- **Set to Playback mode. (➜ 41)**

1 Select [PLAYBACK FOLDER] using the SET button and press the SET button.

2 Select the folder to play back using the SET button and press the SET button.

- The thumbnail screen is displayed with the first file in the selected folder surrounded by a yellow frame.



3 Select the file to playback using the SET button and press the SET button.

[FILE NO. CONT'D]

This function sets the file numbers when the card is exchanged or formatted.

[ON]:	File numbers are retained even when the card is exchanged or formatted.
[OFF]:	File numbers are reset to start from [0001] when the card is exchanged or formatted.

When [FILE NO. CONT'D] is set to [ON] and there are files remaining on the newly inserted card, the files subsequently recorded on the card will be numbered as described below.

When the newly inserted card contains file numbers which are smaller than the file numbers recorded before changing the cards

The numbering continues from the file currently being recorded.

Example:

If you record files up to 0015 on a first card and then exchange the first card for a second card, which already has files up to 0005 recorded on it, the new file numbers on the second card will start from 0016.

When the newly inserted card contains file numbers which are larger than the file numbers recorded before changing the cards

The file number will be consecutive to the last file number recorded on the second card.

Example:

If you record files up to 0005 on a first card and then exchange the first card for a second card, which already has files up to 0015 recorded on it, the new file numbers on the second card will start from 0016.

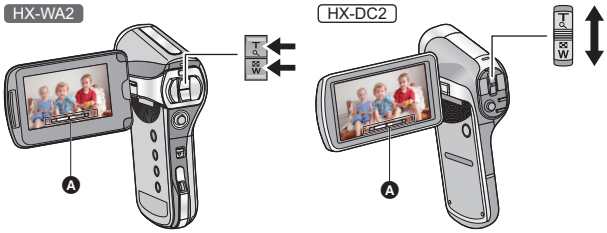
- In the case of the built-in memory, when [FILE NO. CONT'D] is set to [ON] the file numbers can be given consecutive in the same way as when the card is used.

[Eye-Fi]

Please refer to page 157.

Using the zoom

- **Set to Recording mode. (➜ 41)**



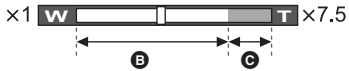
Ⓐ Zoom bar

Zoom button (HX-WA2) / Zoom lever (HX-DC2)

T side:	Close-up recording (zoom in)
W side:	Wide-angle recording (zoom out)

- i.Zoom and digital zoom can be set in [ZOOM MODE]. (➜ 73)

■ About the zoom bar



Ⓑ : Optical zoom
Ⓒ : i.Zoom/Digital zoom (blue)

- During zoom operations, the zoom bar is displayed.
- The magnification displayed at the left and right of the zoom bar is the minimum and maximum zoom magnification.

- When recording motion pictures at high levels of magnification, we recommend fixing the unit to a tripod to prevent it moving.

- HX-DC2
 If you take your finger off the zoom lever during zoom operation, the operation sound may be recorded. When returning the zoom lever to the original position, move it quietly.
- The unit will focus from approximately 1 m or more when the zoom magnification is at its maximum.
 When the zoom magnification is 1×, this unit can focus on a subject approx. 10 cm away from the lens. (When switching to Intelligent Auto Mode, or [FOCUS] is set to (MACRO), you can record from as close as 1 cm with the zoom magnification at 1 times and from 80 cm with the zoom magnification at its maximum.)

Double range zoom

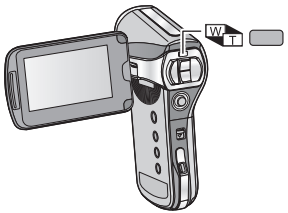
VIDEO

The enlarged size will be approximately double size (double range zoom). Press again to return to normal size.

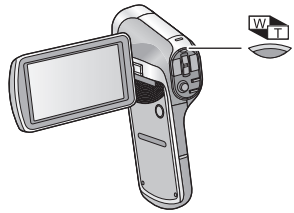
- **Set to Recording mode. (➜ 41)**

Press the zoom range button.

HX-WA2



HX-DC2



- On the normal zoom recording screen, the W icon is displayed. On the double-range zoom recording screen, the T icon is displayed.
- You cannot operate the zoom range button in the i.Zoom/Digital zoom region (blue). (➜ 71)
- The image enlarged using the double range zoom can be recorded only as a motion picture. Still pictures are recorded without being enlarged.

Zoom mode

VIDEO PHOTO

Set the digital zoom and i.Zoom.

- **Select the menu.**

[MENU]: [Setup] → [ZOOM MODE] → desired setting

(DIGITAL ZOOM):	Digital zoom
(i.ZOOM):	This zoom function allows you to maintain high-definition picture quality.
– (OFF):	Optical zoom only

- The larger the digital zoom magnification, the more the image quality is degraded.
- With still picture recording, i.Zoom is disabled.

■ About the maximum zoom magnification

The maximum zoom magnification differs according to the mode and settings of the unit.

	Image stabiliser for motion pictures	Double range zoom	W (Wide)	T (Tele)		
				Zoom mode setting		
				– (OFF)	(i.ZOOM)	(DIGITAL ZOOM)
Motion picture recording	OFF/ON	W	1×	6×	7.5×	60×
		T	2×	12×	15×	120×
	ACTIVE MODE	W	1×	5×	6×	50×
		T	2×	10×	12×	100×
Still picture recording	–	–	1×	5×	5×	50×

Image stabiliser

Use the Image stabiliser to reduce the effects of shake during recording.

- **Set to Recording mode. (➜ 41)**

■ Image stabiliser for motion pictures

Select the menu.

[MENU]: → [E.I.S.(VIDEO)] → desired setting

(ACTIVE MODE):	This setting gives more stabilisation and is suitable for recording when moving.
(ON):	This setting is suitable for recording in a stable state such as scenery.
(OFF):	Cancel the setting.

- When (ACTIVE MODE) is set, the field of view will differ from normal recording.

Video view in normal recording



Video view in (ACTIVE MODE)



■ Image stabiliser for still pictures

Select the menu.

[MENU]: → [E.I.S.(PICTURE)] → [(ON)]

- During zoom operation, image stabiliser does not work.
- When recording with a tripod, we recommend that you set the Image stabiliser off.
- [SCENE MODE] will be set to (OFF) when the [E.I.S.(PICTURE)] is set to (ON) while the [SCENE MODE] (➜ 82) is set to (HDR (Backlight Comp.)).
- Stabilisation may not be possible under strong shaking conditions.
- When [SCENE MODE] is set to (FIREWORKS), (NIGHT SCENERY), (NIGHT PORTRAIT) or (LOW LIGHT), the Image stabiliser may be less effective.
- The screen may shake when using optical zoom or during the auto focus operation, but this does not indicate a fault.

Burst recording

Records a sequence of still pictures at a rate of 10 per second or 1 per second.
Use this function to record fast-moving subject.

- **Set to Recording mode. (➜ 41)**

1 Select the menu.

[MENU]: [Rec] → [BURST] → desired setting

14M BURST (14M BURST):
Records approximately 1 still picture every 1 second.
The unit records as you hold down the button, ending the recording when the maximum number pictures in the burst are reached.

3M BURST (3M BURST):
Records approximately 10 still pictures every 1 second.
The unit records as you hold down the button, ending the recording when the maximum number pictures in the burst are reached.

14M REVERSE BURST (14M REVERSE BURST):
Records approximately 1 still picture every 1 second.
The unit records as you hold down the button. On release of the button, it stores the maximum number of pictures in the burst, going back from the moment of release.

3M REVERSE BURST (3M REVERSE BURST):
Records approximately 10 still pictures every 1 second.
The unit records as you hold down the button. On release of the button, it stores the maximum number of pictures in the burst, going back from the moment of release.

– (OFF):
Cancel the setting.

2 (For auto focus only) Press the button halfway.

3 Press the button fully.

- During recording, lights up in red.
- The auto focus works to fix the focus when the button is pressed halfway.

■ Maximum number of pictures in the burst

[BURST] setting	Maximum number of pictures in the burst
14M / 14M	8
3M / 3M	40

- When recording with the self-timer, the recording ends when the maximum number of pictures in the burst is reached.
- When burst recording, the following functions are disabled and cannot be used.
 - [FLASH]
 - HDR [HDR (Backlight Comp.)] in [SCENE MODE]
 - (HDR (Paint)) in [COLOUR MODE]
 - [PANORAMA]
- The following functions cannot be used with burst recording.
 - [E.I.S.(PICTURE)]
 - [FACE CHASER]
- With burst recording, the shutter speed is faster than 1/30.

Recording panorama still pictures

By recording while panning the unit vertically or horizontally you can record a 180° or 360° panorama still picture.

- **Set to Recording mode. (➜ 41)**

1 Select the menu.

[MENU]: → [PANORAMA] → [(360° PANORAMA)] or [(180° PANORAMA)]

- A white cross is displayed on the LCD monitor.

2 Press the button to start the recording.

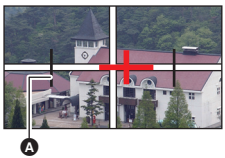
- A red cross is displayed at the centre of the LCD monitor.



3 Pan the unit horizontally or vertically.

- The red cross will shift in the panning direction. Record in such a way that the red cross and the white cross align. (If the red cross separates from the guide, the panorama still picture cannot be correctly recorded.)

(Example) When panning horizontally



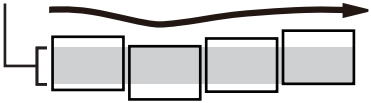
A guide

To stop panorama recording part-way through

Press the button.

■ Recording technique

Move the camera toward the direction of recording taking care not to shake. (Correct recording is not possible when the shake is too big.)



■ About size of still pictures

The sizes of panorama still pictures are as follows.

Panorama setting	Picture size	
	Horizontal panorama still picture	Vertical panorama still picture
(360° PANORAMA)	14400×720	1280×14400
(180° PANORAMA)	7200×720	1280×7200

- During panorama still picture recording, the zoom function is disabled.
- If you record a motion picture with [PANORAMA] set to (360° PANORAMA) or (180° PANORAMA), zoom operations are available during recording but zoom will be automatically cancelled when you stop.
- The panorama still picture that will be recorded will be narrower than what is displayed in the recording screen.
- Panorama still pictures are indicated by or in the 1-file or 8-file thumbnail display.
- When recording panorama still pictures, the following functions are disabled and cannot be used.
 – [FLASH], [SCENE MODE], (HDR (Paint)) in [COLOUR MODE], [BURST] and [SELF TIMER]
- The following functions do not work with recording panorama still pictures.
 – [E.I.S.(PICTURE)]
- When recording panorama still pictures, [FOCUS] is set to (AUTO).

- Focus and white balance will be fixed to the optimal values for the still picture for first frame. Therefore, it may not record with focus or brightness optimal for the whole panorama still picture when focus or brightness changes drastically during the recording.
- Since panorama still picture is composed from multiple still pictures, there may be cases where the subject may warp or connection may stand out.
- In the following cases, it may not be possible to record correctly.
 - When the swing speed is too fast or too slow
 - When recording the subject that have monotone colours or patterns repeating (such as sky, sandy beach, etc.).
 - When recording moving subjects (such as people, pets, automobile, wave, flower dancing in the wind, etc.)
 - When recording in dark place
 - When recording in places with flickering light source such as fluorescent lamp, candle, etc.
 - When recording the unit held away from your body (axis of rotation)
- The recorded panorama picture will not be saved when the recording is terminated before reaching the half of the set angle. Even if the recording exceeds half point, black strip will be recorded in the area that was not recorded when the recording is terminated before reaching the set angle.

Recording underwater [HX-WA2]

The unit can record underwater at depths of down to 3 m (for periods within 60 minutes).

Before recording underwater, be sure to read "(Important) About the Waterproof Performance of this unit [HX-WA2]" (page 8 to 16) and to use the camera correctly. Incorrect use may result water entering the unit and malfunction.

Record with colour balance and audio that are suitable for recording underwater

When recording underwater, set [SCENE MODE] to (UNDER WATER). The colour balance and audio recording will be suitable for recording underwater. (➜ 82)

- **Set to Recording mode. (➜ 41)**

Select the menu. (➜ 62)

[MENU]: → [SCENE MODE] → [(UNDER WATER)]

- When [SCENE MODE] is set to (UNDER WATER), [Before using the unit under water] and [Maintenance after use in water] are displayed. Please check beforehand to maintain the waterproof performance. Press the MENU button to exit the message screen.

- After use underwater, wash the unit in fresh water and dry well. (➜ 13)
- Do not use the Under Water Mode except when recording underwater.
- When recording underwater, the sound of the unit motor will be recorded at a relatively high volume. However, in Under Water Mode, the sound of the motor is suppressed through the action of an audio filter. (sound quality differs to when recording in other modes)

Recording functions of menus

- **Set to Recording mode. (➜ 41)**
- **Select the menu. (➜ 62)**

[MENU]: [REC 1], [REC 2], [REC 3] or [REC 4] → desired setting

[REC 1] RECORDING MENU 1

[REC MODE]

VIDEO AUDIO

You can switch between motion picture recording and audio recording, and switch the image quality of the motion picture to record.

[MENU]: [REC 1] → [REC MODE] → desired setting

1080-60i :	Records with 1920×1080 pixels. (60i)
1080-30p :	Records with 1920×1080 pixels. (30p)
720-60p :	Records with 1280×720 pixels. (60p)
720-30p :	Records with 1280×720 pixels. (30p)
iFrame* :	Records with 960×540 pixels. (30p)
480-30p :	Records with 640×480 pixels. (30p)
:	Records audio. (VOICE RECORD)

* iFrame is a format suitable for Mac (iMovie'11). It is recommended when using a Mac.

- **Recordable time using the battery (➜ 29)**
- This function's default setting is 1080-30p mode.
- Please refer to page 182 about approximate recordable time.
- When the unit is moved a lot or moved quickly, or when a fast-moving subject is recorded (particularly when recording in 480-30p mode), mosaic-type noise may appear at playback.

[PICTURE SIZE] PHOTO

The higher the number of pixels, the higher the clarity of the picture when printing.

[MENU]: → [PICTURE SIZE] → desired setting

Picture size		Aspect ratio
14M	4352×3264	4:3
10M	3744×2808	4:3
5M	2560×1920	4:3
3M	2048×1536	4:3
0.3M	640×480	4:3
10M	4352×2448	16:9
7.8M	3744×2106	16:9
3.5M	2560×1440	16:9
2M	1920×1080	16:9

HX-DC2

[INTELLIGENT AUTO] VIDEO PHOTO

Please refer to page 55.

[SCENE MODE] VIDEO PHOTO

When you record images in different situations, this mode automatically sets optimum shutter speeds and apertures.

[MENU]: → [SCENE MODE] → desired setting

– (OFF):
Cancel the setting

(SPORTS):
To make fast moving scenes less shaky with slow playback and pause of playback

(PORTRAIT):
To make people stand out against the background

(SPOT LIGHT):
Improved quality when subject is brightly illuminated

(SNOW):
Improved image quality when shooting in snowy locations

(BEACH):
To make blue in the sea or sky vibrant

(SUNSET):
To make red in the sunrise or sunset vibrant

(FIREWORKS):
To capture the fireworks in the night sky beautifully

(LANDSCAPE):
For spatial scenery

(NIGHT SCENERY):
To capture the evening or night scenery beautifully

(NIGHT PORTRAIT):
To capture a person and the background brightly

(HDR (Backlight Comp.))*:
Provides definition in regions that would otherwise be black or white

HX-WA2

(UNDER WATER):
For reduced background noise and clear underwater recording (➜ 80)

(LOW LIGHT):
For dark scenes, such as at dusk

* Mode for still picture recording only. This will not operate during the motion picture recording.

- **(SUNSET/FIREWORKS/LANDSCAPE/NIGHT SCENERY/NIGHT PORTRAIT)**
 – Image may get blurry when close object is recorded.

- **(FIREWORKS)**
 - The shutter speed is 1/30. (Motion picture recording)
 - Image may get washed out when recorded in bright surrounding.
 - (the camera shake icon) is displayed constantly when recording still pictures, but this does not indicate a fault.
- **(NIGHT SCENERY/NIGHT PORTRAIT/HDR (Backlight Comp.))**
 - Using a tripod is recommended.
- **(LOW LIGHT)**
 - The shutter speed is 1/15 or more. (Motion picture recording)
- **(HDR (Backlight Comp.))**
 - When recording a moving subject, a ghost image may appear.
 - The field of view of the recorded still picture is smaller than the range displayed on the recording screen.

■ Limitations of scene mode settings

Setting	Limitations
(SPORTS)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to .
(PORTRAIT)	
(SPOT LIGHT)	
(SNOW)	
(BEACH)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . WHITE BALANCE: Fixed to AWB.
(SUNSET)	
(FIREWORKS)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . FLASH: Fixed to . ISO: Fixed to AUTO. FACE CHASER: Fixed to — (OFF). EXP COMPENSATION: Fixed to ± 0. WHITE BALANCE: Fixed to AWB.
(LANDSCAPE)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . FACE CHASER: Fixed to — (OFF).

Setting	Limitations
(NIGHT SCENERY)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . FLASH: Fixed to . FACE CHASER: Fixed to — (OFF).
(NIGHT PORTRAIT)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to .
(HDR (Backlight Comp.))	BURST: Fixed to — (OFF). PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . FLASH: Fixed to . E.I.S.(PICTURE): Fixed to . METERING MODE: Fixed to . ISO: Fixed to AUTO.
HX-WA2 **(UNDER WATER)**	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to .
(LOW LIGHT)	PANORAMA: Fixed to — (OFF). COLOUR MODE: Fixed to . FOCUS: Fixed to . FLASH: Fixed to . ISO: Fixed to AUTO.

[BURST] PHOTO

Please refer to page 75.

[PANORAMA] PHOTO

Please refer to page 77.

HX-WA2

[FLASH]

PHOTO

[MENU]: → **[FLASH]** → **desired setting**

- Please see below. (HX-DC2 [FLASH])

RECORDING MENU 2

HX-DC2

[FLASH]

PHOTO

When the button is pressed, the flash is activated and the picture will be recorded. Use the built-in flash in order to record still pictures in dark places.

[MENU]: → **[FLASH]** → **desired setting**

ϟA (AUTO):	The unit determines the brightness of the subject and emits a flash if necessary.
ϟ (ON):	The unit emits a flash irrespective of the brightness of the subject.
(OFF):	Cancel the setting.

- When [FLASH] is set to ϟA (AUTO) or ϟ (ON), [BURST] and [PANORAMA] are set to — (OFF).
- [SCENE MODE] will be set to — (OFF) when the [FLASH] is set to ϟA (AUTO) or ϟ (ON) while the [SCENE MODE] (➜ 82) is set to (FIREWORKS), (NIGHT SCENERY), (HDR (Backlight Comp.)), or (LOW LIGHT).
- If you register a shortcut function (➜ 93) to the SET button, you can change the flash setting from the recording screen.

[SELF TIMER]

VIDEO PHOTO AUDIO

The timer can be used to record images or audio.

[MENU]: → [SELF TIMER] → desired setting

(OFF):	Cancel the setting
2 (2sec):	Records after 2 seconds
10 (10sec):	Records after 10 seconds

When 2 (2sec) is selected
When you press the button or the recording start/stop button, the status indicator flashes red for approximately 2 seconds, then recording begins.
On the LCD monitor, an indication of (→) appears to notify you of the recording timing.

When 10 (10sec) is selected
When you press the button or the recording start/stop button, the status indicator flashes red for approximately 10 seconds, then recording begins.
On the LCD monitor, an indication of (→ → → →) appears to notify you of the recording timing.

- After the recording, the self-timer setting is cancelled.

To stop the timer midway through
Press the button or the recording start/stop button.

- Setting the self-timer to 2 or 10 is a good way to prevent image shake when the button is pressed while using a tripod etc.
- If you register a shortcut function (➜ 93) to the SET button, you can change the self-timer setting from the recording screen.
- If you set [FOCUS] (➜ 101) to (AUTO) or (MACRO) when recording still pictures, the unit will focus automatically immediately before recording.

- With motion picture recording/audio recording, recording does not turn off automatically.
- If you perform any of the following cases, the self-timer will be cancelled.
 - If you turn the unit off
 - If you change to the playback mode
 - If you send unit into standby mode by closing the LCD monitor
 - When it goes into sleep mode

[FOCUS] VIDEO PHOTO

Please refer to page 101.

[FOCUS MODE] VIDEO PHOTO

You can select the focusing method according to the position of the subject.

[MENU]: → [FOCUS MODE] → desired setting

(9-PT AUTOFOCUS):	The unit determines the focus automatically from 9 focus points () in the recording range.
(SPOT FOCUS):	The unit focuses on the subject over the focus mark (+) displayed at the centre of the LCD monitor.

[METERING MODE] VIDEO PHOTO

You can change the light-metering method used to measure brightness.

[MENU]: → [METERING MODE] → desired setting

(MULTI):	The unit automatically assesses the distribution of brightness over the screen and meters to ensure that the exposure is appropriate.
(CENTRE):	The unit averages light measurements over the entire screen, giving higher weight to the subject at the centre of the screen.
(SPOT):	The unit meters the subject over spot meter target () displayed at the centre of the LCD monitor.

- [SCENE MODE] will be set to — (OFF) when the [METERING MODE] is set to (CENTRE) or (SPOT) while the [SCENE MODE] (➜ 82) is set to (HDR (Backlight Comp.)).

[COLOUR MODE] VIDEO PHOTO

You record in different colours and add effects such as skin smoothing.

[MENU]: → [COLOUR MODE] → desired setting

(OFF):	Cancel the setting.
(HDR (Paint))*:	Records still pictures with picture effects.
(SOFT SKIN):	Records with skin softening effects.
(MONOCHROME):	Records in monochrome.
(SEPIA):	Records with colours adjusted to sepia.
(VIVID):	Reduced sharpness and increases colour.
(SOFT):	Records with reduced sharpness for a softer image.

* Mode for still picture recording only

- When [COLOUR MODE] is set, [SCENE MODE] (➜ 82) is cancelled.
- **(HDR (Paint))**
 - We recommend use of a tripod.
 - The flash is disabled.
 - [BURST] and [PANORAMA] are set to — (OFF).
 - [E.I.S.(PICTURE)] is set to (OFF).
 - [METERING MODE] is set to (MULTI).
 - [ISO] is set to AUTO.
 - The field of view of the recorded still picture is smaller than the range visible on the recording screen.

HX-WA2

[ISO]

VIDEO PHOTO

[MENU]: → [ISO] → desired setting

- Please see below. (HX-DC2 [ISO])

RECORDING MENU 3

HX-DC2

[ISO]

VIDEO PHOTO

Although, with the default settings, the ISO sensitivity is set automatically in accordance with the brightness of the subject, the ISO sensitivity can be fixed.

[MENU]: → [ISO] → desired setting

AUTO:	ISO sensitivity is set automatically.
50:	Sets the sensitivity to ISO 50.
100:	Sets the sensitivity to ISO 100.
200:	Sets the sensitivity to ISO 200.
400:	Sets the sensitivity to ISO 400.
800:	Sets the sensitivity to ISO 800.
1600:	Sets the sensitivity to ISO 1600.

- The displayed ISO display value is the default output sensitivity.

- The higher the ISO sensitivity, the greater the capability of the unit to record with fast shutter speeds and in dark environments. However, a higher sensitivity may also mean more noise in the recorded image and a more grainy image.

- [SCENE MODE] will be set to ⊟ (OFF) when the [ISO] is set to other than AUTO while the [SCENE MODE] (➜ 82) is set to ✳ (FIREWORKS), HDR (HDR (Backlight Comp.)), or (LOW LIGHT).
- If you register a shortcut function (➜ 93) to the SET button, you can change the ISO sensitivity setting from the recording screen.

[WHITE BALANCE]

VIDEO PHOTO

Please refer to page 99.

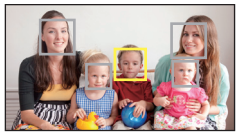
[FACE CHASER]

VIDEO PHOTO

The detected face is displayed in the frame.

[MENU]: → [FACE CHASER] → [(ON)]

■ About prioritised face framing



The prioritised face frame is displayed in yellow. When the unit is set to Portrait mode in Intelligent Auto Mode, the unit will focus on the prioritised face frame and adjust the brightness accordingly.

- The grey frames are for face detection only.
- When you press the button halfway while recording still pictures, the unit focuses on the prioritised frame. When focus is achieved, the prioritised frame turns green.
- A maximum of 15 frames are detected, with the frames near the centre of the screen and large frames being prioritised.

- For still pictures with detected faces, is displayed on the 1-file thumbnail display. (➜ 60)
- If the subject is small or dark on the LCD monitor, the unit may not be able to detect it.
- [SCENE MODE] will be automatically set to ⊟ (OFF) when the [FACE CHASER] is set to (ON) while the [SCENE MODE] (➜ 82) is set to ✳ (FIREWORKS), (LANDSCAPE), or (NIGHT SCENERY).

- [FOCUS MODE] (➜ 88) is set to (9-PT AUTOFOCUS) and [METERING MODE] (➜ 89) is set to (MULTI).
- Face detection is disabled when using burst recording or panorama still picture recording.
- When [FOCUS] (➜ 101) is set to MF (MANUAL), Auto focus is disabled.
- When it is set to [ISO] (➜ 91) or [EXP COMPENSATION] (➜ 96), the brightness is not adjusted.

[E.I.S.(VIDEO)] VIDEO

Please refer to page 74.

[E.I.S.(PICTURE)] PHOTO

Please refer to page 74.

[SHORTCUTS] VIDEO PHOTO AUDIO

This setting registers the functions (shortcut functions) performed when the SET button is tipped up, down, left and right with the recording screen displayed.

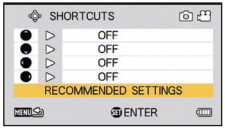
[MENU]: → [SHORTCUTS]

1 Select the destination (up, down, left or right on the SET button) for the function using the SET button and press the SET button.

/ / / :
Functions are registered individually to up, down, left and right of the SET button.

RECOMMENDED SETTINGS:
Regular functions are automatically registered.





2 Select the function to register using the SET button, and press the SET button.

AF-L **(AF LOCK):**
Locks the focus. (➜ 95)

AE-L **(AE LOCK):**
Locks the exposure. (➜ 95)

(FOCUS):
Sets the focus. (➜ 101)
(Can be registered to ⌃ and ⌄ only)

(FLASH):
Sets the flash operation. (➜ 86)

(EXP COMPENSATION):
Corrects the exposure. (➜ 96)

ISO **(ISO):**
Sets the ISO sensitivity. (➜ 91)

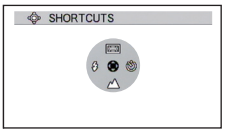
(SELF TIMER):
Sets the self-timer. (➜ 87)

(PHOTO VIEW):
Sets photo view. (➜ 97)

[OFF]:
Shortcut functions are not registered.

- To continue and register other functions, repeat Steps 1 and 2.

3 Press the MENU button.



- A confirmation screen for the shortcut settings appears.

4 Press the MENU button to complete the settings.

5 Tilt the SET button in the direction in which you registered the function.

- Each tip of the SET button changes the registered function setting.

- To confirm the shortcut settings, press the MENU button on the screen in Step 1. A confirmation screen appears.

■ AF lock

If you register AF lock as a shortcut function (➜ 93), you can record with the focus locked.

- **Register the shortcut function. (➜ 93)**

Tilt the SET button in the direction to which you registered AF lock.

- AF-L will appear on the LCD monitor.
- When [FOCUS] is set to MF (MANUAL), AF Lock is disabled.
- The AF lock setting is cancelled if any of the following operations is performed.
 - Setting playback mode
 - If [SCENE MODE] is set to (FIREWORKS)
 - If the [FOCUS] setting is changed
 - Turning off the unit
 - Setting standby mode

■ AE lock

If you register AE lock as a shortcut function (➜ 93), you can record with the exposure locked.

- **Register the shortcut function. (➜ 93)**

Tilt the SET button in the direction to which you registered AE lock.

- AE-L will appear on the LCD monitor.
- The AE lock setting is cancelled if any of the following operations is performed.
 - Setting playback mode
 - If the [SCENE MODE] setting is changed
 - If [COLOUR MODE] is set to (HDR (Paint))
 - If the [ISO] setting is changed
 - If the [WHITE BALANCE] setting is changed
 - If the [EXP COMPENSATION] setting is changed
 - Turning off the unit
 - Setting standby mode

■ Exposure compensation

If you register exposure compensation as a shortcut function (➜ 93), you can record with altered brightness.

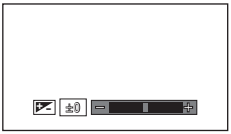
- **Register the shortcut function (➜ 93)**

1 Tilt the SET button in the direction to which you registered the exposure compensation.

- The exposure compensation bar is displayed.

2 Tilt the SET button to the left or right to correct the exposure.





- The exposure compensation value is displayed to the left side of the exposure compensation bar.
- The exposure compensation value can be corrected in the range –1.8 to +1.8.
- The exposure compensation bar disappears when the SET button is pressed.
- The exposure setting is cancelled if any of the following operations is performed.
 - Setting the pointer to ± 0
 - Setting playback mode
 - Changing the [SCENE MODE] settings
 - Turning off the unit
 - Setting standby mode

HX-WA2

[PHOTO VIEW]

VIDEO PHOTO

[MENU]: 3 → **[PHOTO VIEW]** → **desired setting**

- Please see below. (HX-DC2 [PHOTO VIEW])

4 RECORDING MENU 4

HX-DC2

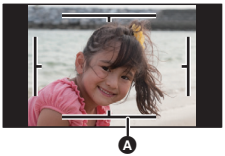
[PHOTO VIEW]

VIDEO PHOTO

Selects the desired field of view (photo view or video view) for the recording standby screen display. When photo view is selected, a frame to show the field of view during video recording appears.

[MENU]: 4 → **[PHOTO VIEW]** → **desired setting**

(ON): Photo view



(OFF): Video view



A Video recording area

- If you register a shortcut function (➜ 93) to the SET button, you can change the photo view setting from the recording screen.

[ZOOM MODE]

VIDEO PHOTO

Please refer to page 73.

[WIND CUT]

VIDEO AUDIO

This is for reducing the wind noise coming into the built-in microphones.

[MENU]: → [WIND CUT] → [(ON)]

- This function's default setting is [(ON)].
- You may not see the full effect depending on the recording conditions.

[AUTO REVIEW]

PHOTO

Sets the period for which the recorded image appears on the LCD monitor after the button is pressed.

[MENU]: → [AUTO REVIEW] → desired setting

(1sec):	Still pictures are displayed for approximately 1 second after being recorded.
(2sec):	Still pictures are displayed for approximately 2 seconds after being recorded.
(OFF):	Still pictures are not displayed after being recorded.

Manual recording

White Balance

Automatic White Balance function may not reproduce natural colours depending on the scenes or lighting conditions. If so, you can adjust the White Balance manually.

1 Select the menu.

[MENU]: → [WHITE BALANCE]

2 Select the white balance using the SET button, and press the SET button.

AWB (AUTO):	The unit distinguishes the weather and lighting at the recording location and automatically adjusts the white balance. (Auto)
(SUNNY):	Outdoors under a clear sky
(CLOUDY):	Outdoors under cloudy sky
(INDOOR 1):	Incandescent light, video lights like in the studio, etc.
(INDOOR 2):	Colour fluorescent lamps, sodium lamps in gymnasiums etc.
(WHITE SET):	● Mercury-vapor lamps, sodium lamps, some fluorescent lights ● Lights used for wedding receptions at hotels, stage spotlights in theaters ● Sunrise, sunset, etc.

● To return to auto setting, select AWB (AUTO).

■ To set the White Balance manually

1 Point the unit at a white subject that fills the screen.

2 Select the (WHITE SET) and press the SET button.

- The LCD monitor display will go dark for a moment and then return to the recording menu. When the icon appears on the recording menu, the white balance has been set.

- When the brightness changes or the recording location changes and the colour balance is not longer correct, check whether the white balance setting is suitable for the light source.
- HX-DC2
 If you turn on the unit with the lens cap still fitted, the auto white balance will not be set correctly. Always remove the lens cap before turning on the unit.
- [SCENE MODE] will be set to (OFF) when the [WHITE BALANCE] is set to other than AWB (AUTO) while the [SCENE MODE] (➜ 82) is set to (BEACH), (SUNSET), or (FIREWORKS).

Setting the focus and recording

Set the focus in accordance with the distance to the subject.

1 Select the menu.

[MENU]: → [FOCUS] → desired setting

2 Select the item to set using the SET button and press the SET button.

(AUTO):	The focus is set automatically.
MF **(MANUAL):**	Adjusts the focus manually when it is difficult to achieve focus automatically.
(MACRO):	Select when recording a subject from close range.

■ Using manual focus

1 Select MF (MANUAL) and press the SET button.

- The bar for setting the focus appears.

2 Tilt the SET button left or right to set the focus, and press the SET button.

- Set the focus and return to the recording screen.



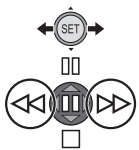
- When focus is set to MF (MANUAL) or (MACRO), the [PANORAMA] and [SCENE MODE] functions are set to (OFF).
- Even with a setting of MF (MANUAL) or (MACRO), if you set the [PANORAMA] and [SCENE MODE] to a setting other than (OFF), the focus setting is set to (AUTO).
- When you set the focus to (MACRO), start with the zoom set to Wide (W).
- If you register a shortcut function (➜ 93) to the SET button, you can change the focus setting from the recording screen.
- In certain cases, it may be difficult to achieve focus automatically.

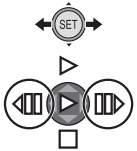
Playback Operations

Playback using operation icon

VIDEO PHOTO AUDIO

For details on the basic playback operations, refer to page 58.

Playback operation	SET button/ Playback display	Operating steps
VIDEO AUDIO **Fast forward/ rewind playback**	**During Playback** 	**Tilt the SET button to the right during playback for fast-forward playback (tilt to the left for rewind playback).** ● Each tip of the SET button changes the playback speed. (Maximum 15× normal speed) ● Tilt the SET button in the opposite direction during forward winding or rewinding to slow the winding speed. ● Press the SET button to restore normal playback.

Playback operation	SET button/ Playback display	Operating steps
VIDEO **Slow-motion playback**	**During Pause** 	**With the playback paused, tilt and hold the SET button to the right for slow motion playback until release (tilt and hold to the left for reverse slow motion playback).** ● Press the SET button to restore normal playback.
VIDEO **Frame-by-frame playback** The motion picture is advanced one frame at a time.		**With playback paused, tilt the SET button to the right (tilt to the left for reverse frame-by-frame playback)** ● Reverse frame-by-frame playback will be in 1 second interval (1080-60i , 1080-30p , 720-30p , iFrame , and 480-30p) or 0.5 second interval (720-60p). ● Press the SET button to restore normal playback.
PHOTO **Scroll playback**	**During stop/ during pause** 	**Press the SET button during the display of the panorama still picture** ● When playing back a horizontal panorama still picture, the playback scrolls from left to right. ● When playing back a vertical panorama still picture, the playback scrolls from down to up. ● Pressing the SET button again to pause the scroll playback.

Creating still picture from motion picture

VIDEO

A single frame from the recorded motion picture can be saved as a still picture. The picture size of the still picture to be created will differ depending on the recording mode of the recorded motion picture.

1 Pause at the location to be saved as a still picture during the playback.

- You may find it convenient to use slow motion playback and frame-by-frame playback here.

2 Press the button fully.

3 Select the aspect ratio of the still picture to be saved and press the SET button.

Aspect ratio	Recording mode	Picture size
16:9	1080-60i / 1080-30p	1920×1080
	720-60p / 720-30p	1280×720
	iFrame	960×540
4:3	1080-60i* / 1080-30p*	1920×1440
	720-60p* / 720-30p*	1280×960
	iFrame*	960×720
	480-30p	640×480

* White bands will be recorded at the top and bottom of still pictures.

- Date the motion picture was recorded will be registered as date of the still picture.
- Quality will be different from the normal still picture.
- When creating a still picture from a recorded motion picture in 480-30p recording mode, [16:9] cannot be selected.
- The still picture is saved with a new image number.

Cutting out a section of a panorama still picture

PHOTO

You can cut out and save a section of a panorama still picture you have recorded.

1 **Display the panorama still picture.**

2 **Press the SET button to start scroll playback of the panorama still picture.**

3 **Press the SET button to pause at the section you wish to cut out.**

4 **Press the button.**

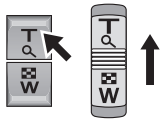
- The cut-out still picture is saved with picture size of 1280×720.
- The date and time of the recording of the panorama still picture are stored as the date and time of the cut-out picture.
- The cut-out still picture is saved with a new image number.

Zooming in on a still picture during playback (Playback zoom)

PHOTO

You can zoom in on still pictures during playback.

1 Operate the zoom button (HX-WA2) or zoom lever (HX-DC2) to Q side.



- You can zoom in to a maximum of 68× (6800%). (The maximum zoom magnification differs according to the size of the still picture.)
- The unit zooms in on the central portion of the image.
- If the still picture has been recorded using face detection (➜ 92), the unit zooms in on the detected face.
- When you zoom in on a rotated still picture with a 4:3 or 16:9 aspect ratio, the still picture before rotation is displayed. With a panorama still picture, the rotated picture is displayed. (➜ 111)
- The more a picture is enlarged, the more its quality deteriorates.

2 Shift the position of the zoomed portion using the SET button.





Zooming out from the zoomed still picture

Operate the zoom button (HX-WA2) or zoom lever (HX-DC2) to W side to zoom out.

Press the SET button to restore the normal display (100%) screen.

■ Saving the zoomed still picture

Press the button while zoomed in.

- The rotation information is retained for the 4:3 and 16:9 rotated still pictures. The rotation information is not retained for the panorama still picture, but rotated still picture is saved.
- In the case of still pictures recorded using face detection, the face detection data is not retained.

- The date and time of the recording of the original still picture are stored as the date and time of any picture stored after zooming.

Various playback functions

Changing the playback settings and playing back the slide show

VIDEO PHOTO AUDIO

- **Set to Playback mode. (➜ 41)**

[MENU]: [PLAY] → [SLIDESHOW] → desired setting

1 **Select the item to set using the SET button and press the SET button.**

[MODE]:
Select the type ([ALL]/[VIDEO]/[PICTURE]) of the file to play back.

[SLIDES INTERVAL]*:
Select the display interval for still picture playback.

[EFFECT SETUP]*:
Select the effects for still picture playback.

[MUSIC SELECT]*:
Select the music for still picture playback.

[START]:
Start the slide show.

* These settings are only available when [ALL] or [PICTURE] has been selected in [MODE].

2 (On selecting [MODE])
Select the type of file to play back using the SET button and press the SET button.

(On selecting [SLIDES INTERVAL])
Select an item using the SET button and press the SET button.

[SHORT]:	approx. 1 second
[NORMAL]:	approx. 5 seconds
[LONG]:	approx. 15 seconds

(On selecting [EFFECT SETUP])

Select the desired effect using the SET button and press the SET button.

- [EFFECT SETUP] is disabled for the playback of panorama still pictures.

(On selecting [MUSIC SELECT])

Select the desired music using the SET button and press the SET button.

- When you are playing back scenes/audio files, the audio of the scenes/audio files is played back without music.

3 Select [START] using the SET button and press the SET button.

- Panorama still pictures are played back as follows.
 - Horizontal panorama still picture: the playback scrolls from left to right.
 - Vertical panorama still picture: playback scrolls from down to up.
- To adjust the volume during a slideshow, operate the volume button (HX-WA2) or volume lever (HX-DC2). (➜ 60)
- During playback, the slideshow will stop if you perform any operation except operations on the volume button (HX-WA2) or volume lever (HX-DC2).

Displaying file information

VIDEO PHOTO AUDIO

You can display the information of files recorded with the unit.

- **Set to Playback mode. (➜ 41)**

1 Using the SET button, select file for which to display information.

2 Press and hold down the MENU button for 1 second or more.

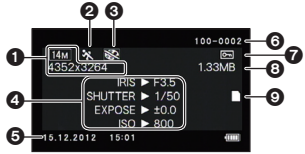
- To make the information disappear, press the MENU button.

VIDEO



1. Recording mode
 Recording format
2. Recording start time and date
3. File number
4. Protection setting
5. File size
6. Recording time
7. Recording media

PHOTO



1. Picture size
2. Scene mode
3. Colour mode
4. IRIS: Aperture
 SHUTTER: Shutter speed
 EXPOSE: Exposure correction
 ISO: ISO sensitivity
5. Recording start time and date
6. File number
7. Protection setting
8. File size
9. Recording media

AUDIO



❶ Recording mode
Recording format
❷ Recording start time and date
❸ File number
❹ Protection setting
❺ File size
❻ Recording time
❼ Recording media

Using the playback menu

- **Set to Playback mode. (➜ 41)**
- **Select the menu. (➜ 62)**

[MENU]: [PB1] or [PB2] → desired setting

[PB1] PLAYBACK MENU 1

[SLIDESHOW]

VIDEO PHOTO AUDIO

Please refer to page 107.

[PLAY VOLUME]

VIDEO AUDIO

Sets the playback volume for scene and audio files.
Tilt the SET button right or left and press the SET button.

[PROTECT] or [TRANSFER/PROTECT]

VIDEO PHOTO AUDIO

Please refer to page 120 for details about protection setting.
Please refer to page 158 for details about selective forwarding.

[DELETE]

VIDEO PHOTO AUDIO

Please refer to page 117.

[ROTATE]

PHOTO

You can rotate still pictures.

1 Select the still picture to rotate using the thumbnail screen.

- Move the yellow frame over the still picture you wish to rotate.

2 Select the menu.

[MENU]: [PLAY] → [ROTATE] → [RIGHT] or [LEFT]

- To rotate another still picture, tilt the SET button left and right to select a still picture, select [RIGHT] or [LEFT], and press the SET button.

3 Press the MENU button to complete the settings.

- The still picture cannot be rotated if it has been protected. Turn off the protection before the rotation operation. (➜ 120)

[RESIZE]

PHOTO

You can reduce the size of the still picture and save as a new still picture.

1 Select the still picture to resize using the thumbnail screen.

- Move the yellow frame over the still picture you wish to resize.

2 Select the menu.

[MENU]: [PLAY] → [RESIZE] → desired setting

Size of original image	Resize setting	Size after resizing
14M/10M/5M/3M	2M	1600×1200
	0.3M	640×480
10M/7.8M/3.5M/2M	2M*	1920×1080
	0.9M	1280×720

- The resized still picture is saved with a new image number.
- Still picture with picture size of 0.3M and panorama still picture cannot be resized.

* Cannot be selected when the size of the original image is 2M.

PLAYBACK MENU 2

[RED-EYE CORRECT.]

PHOTO

Colour-corrects eyes which appear red in still pictures (red-eye phenomenon). When [SAVE AS NEW] is set, the still picture is saved with a new image number.

1 Select the still picture to undergo red-eye correction using the thumbnail screen.

- Move the yellow frame over the still picture which is to undergo red-eye correction.

2 Select the menu.

[MENU]: PLAYBACK MENU 2 → [RED-EYE CORRECT.] → [CORRECTION]

- A correction confirmation screen appears. Check the correction location, which is surrounded by a red frame, and press the SET button.

3 Select the saving method and press the SET button.

[SAVE AS NEW]:	The corrected still picture is saved as a new still picture.
[OVERWRITE]:	The original still picture is deleted and only the corrected still picture is saved.

- Red-eye cannot be corrected in panorama still pictures or still pictures recorded with [COLOUR MODE] set to (HDR (Paint)).
- Because the unit automatically corrects the portion it recognises as requiring correction, it may not always make the correction correctly.

[EDIT VIDEO]

VIDEO

You can cut unwanted sections from scenes. (scene splitting) You can also splice multiple scenes together. (Scene splicing)

■ Splitting a scene

1 Select the scene to split using the thumbnail screen.

- Move the yellow frame over the scene you wish to split.

2 Select the menu.

[MENU]: [2] → [EDIT VIDEO] → [] (SPLIT)]

3 Specify the starting position for the scene.



- Play back to near the position where you wish the scene to start, then pause playback and specify the starting position precisely using frame-by-frame playback. The pause position will be the starting position of the scene.
- If you wish the split scene to start from the beginning of the scene, go to Step 4.

Operations

Play back	With the unit paused, tilt the SET button to the right for approximately 2 seconds to play back normally, and to the left to play back in the reverse direction.
Pause	During playback, press the SET button.
Fast forward/ rewind	During playback, you can change the playback speed by tilting the SET button right or left.
Frame-by-frame	With the unit paused, tilt the SET button to the right to advance frame-by-frame, and to the left to reverse frame-by-frame.

4 Tilt the SET button up.

5 Specify the end position for the scene.

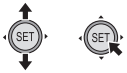
- The screen for specifying the end position of the scene appears.
- Set the end position by performing the same operations as when setting the start position.
- The portions displayed in green are saved.
- If you wish to splice a preceding section to a subsequent section, tilt the SET button down. Each downward tilt of the SET button changes the section to be deleted.



6 Press the [camera] button or the recording start/stop button.

7 Select a saving method using the SET button and press the SET button.

[SAVE AS NEW]:	The split scene is saved as a new scene.
[OVERWRITE]:	The original scene is deleted and only the split scene is saved.
[REVIEW CLIP]:	The scene is played back in the split state.



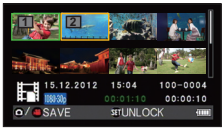


■ Scene splicing

1 Select the menu.

[MENU]: [VIDEO] → [EDIT VIDEO] → []+[(SPLICE)]

2 Move the yellow frame over the scenes you wish to splice and press the SET button.

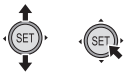


- Scenes recorded using different recording modes cannot be spliced.
- The scenes you select for splicing are assigned numbers.
- You can continue selecting up to maximum of 9 scenes.
- The scenes are spliced in numerical order according to the assigned numbers.
- To cancel a selection, press the SET button again.

3 Press the button or the recording start/stop button.

4 Select a saving method using the SET button and press the SET button.

[SAVE AS NEW]:	The spliced scenes are saved as a new scene.
[OVERWRITE]:	The spliced scene is saved by writing over the file you initially selected.
[REVIEW CLIP]:	The scene resulting from the splicing is played back.





- Do not turn off the unit during motion picture editing process. If the unit is turned off, there is a risk that the edited files and original files will be lost.
- When editing ends, the unit returns to thumbnail display.
- If the total size of the file exceeds 4 GB, you cannot splice.
- If the original scene is protected, you cannot overwrite it when saving.
- Audio files cannot be split or spliced.
- To adjust the volume during a playback review, operate the volume button (HX-WA2) or volume lever (HX-DC2). (➜ 60)
- When editing long motion pictures, the processing will take longer due the time it takes to process large files. When editing scenes on the unit, make sure that the battery does not run out during the processing by using a battery with sufficient charge on it or the AC adaptor.
- For editing long scenes, we recommend using a PC (HD Writer VE 2.0).
- It may not be possible to split short scenes.
- The actual splitting point may differ slightly from the specified position.

[COPY]

VIDEO PHOTO AUDIO

Please refer to page 131.

[UPLOAD SET]

VIDEO PHOTO

Please refer to page 154.

Deleting scenes/still pictures/ audio files

When an SD card is inserted, the files and folder on the SD card are deleted. When not inserted, the files and folders in the built-in memory are deleted.

Deleted scenes/still pictures/audio files cannot be restored, so perform appropriate confirmation of the contents before proceeding with deletion.

Deleting displayed file

- **Set to Playback mode. (➜ 41)**
- **Switch from thumbnail display to 1-file display. (➜ 60)**

1 **Select the file to delete using the SET button.**





2 **Tilt the SET button up.**

3 **Select [DELETE] using the SET button and press the SET button.**

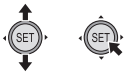
Deleting multiple files at once

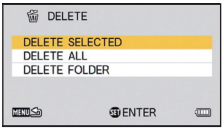
- **Set to Playback mode. (➜ 41)**

1 **Select the menu.**

[MENU]: → [DELETE]

2 Using the SET button, select [DELETE SELECTED], [DELETE ALL] or [DELETE FOLDER] and press the SET button.





■ Deleting selected files

3 (When [DELETE SELECTED] is selected in Step 2)
Select the file to delete using the SET button and press the SET button.

- 🗑 will appear on the selected file. To cancel, press the SET button again.
- You can continue selecting up to maximum of 100 files.

4 Press the 📷 button or the recording start/stop button.

- A delete confirmation screen appears.

5 Select [YES] using the SET button and press the SET button.

- The selected files are deleted.

■ Deleting all files

3 (When [DELETE ALL] is selected in Step 2)
Select [DELETE] using the SET button and press the SET button.

- A delete confirmation screen appears.

4 Select [YES] using the SET button and press the SET button.

- All the files will be deleted.

■ Deleting a folder

3 (When [DELETE FOLDER] is selected in Step 2)
Select the folder to delete using the SET button and press the SET button.

- A delete confirmation screen appears.

4 **Select [YES] using the SET button and press the SET button.**

- A further confirmation screen appears. Select [YES] and press the SET button to delete the folder.

- Files which cannot be played back (the thumbnails are displayed as [!]) cannot be deleted.
- The deletion may take time if there are many files.
- If you delete scenes recorded on other products or still pictures conforming to DCF standard with this unit, all the data related to the scenes/still pictures may be deleted.
- When still pictures recorded on an SD card by other products are deleted, a still picture (other than JPEG) that cannot be played back on this unit may be erased.
- Files which are protected cannot be deleted. To delete a protected file, first remove the protection and then delete. (➜ 120)

Protecting a file

Files can be protected so that they are not deleted by mistake. **(Even if you protect some files, formatting the media will delete them.)**

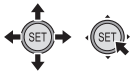
- **Set to Playback mode. (➜ 41)**

1 Select the menu.

[MENU]: [PLAY] → [PROTECT]*

* When you are using an Eye-Fi card which has already been set to selective forwarding with a PC, [TRANSFER/PROTECT] is displayed.

2 Select the file you wish to protect using the SET button and press the SET button.





- appears. To cancel the selection, press the SET button again.
- is displayed on the thumbnail for 1 file. (➜ 60)

3 Press the MENU button to complete the settings.

Watching Video/Pictures on your TV

Confirm the terminals on your TV and use a cable compatible with the terminals. Image quality may vary with the connected terminals.

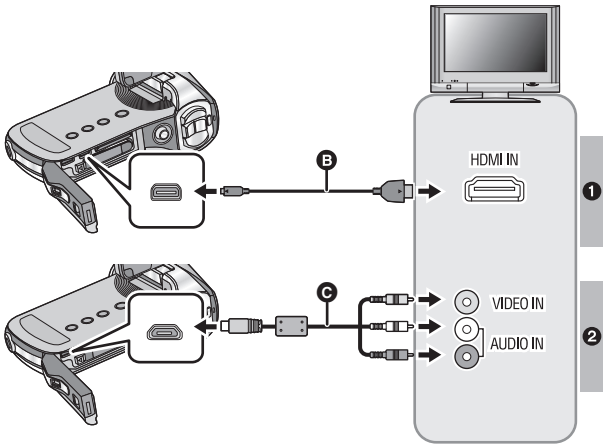
- Ⓐ High quality
- ❶ HDMI terminal
- ❷ Video terminal



- **Always use the supplied AV cable.**
- HDMI is the interface for digital devices. If you connect this unit to a HDMI compatible high definition TV and then play back the recorded high definition images, you can enjoy them in high resolution with high quality sound.
- Turn down the volume before connecting.

1 Connect this unit to a TV.

HX-WA2



Ⓑ HDMI micro cable (optional)
- Be sure to connect to the HDMI terminal.

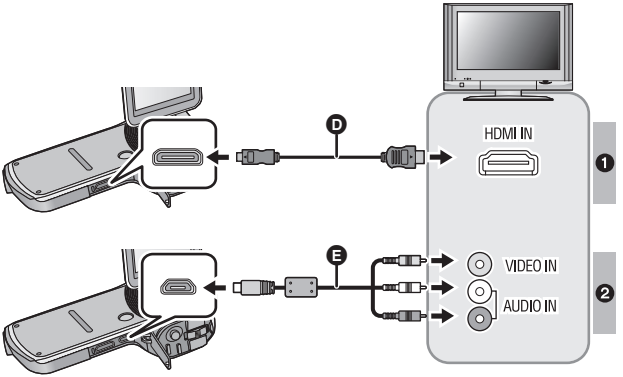
Ⓒ AV cable (supplied)

Picture quality

❶ High definition images when connecting to HDMI terminal
❷ Standard images when connecting to video terminal

Cables	Reference items
Ⓑ HDMI micro cable (optional)	● Connecting with a HDMI micro cable/ HDMI mini cable (➜ 126) ● Playback using VIERA Link (➜ 127)

HX-DC2



Ⓓ HDMI mini cable (optional)
- Be sure to connect to the HDMI terminal.

Ⓔ AV cable (supplied)

Picture quality

❶ High definition images when connecting to HDMI terminal
❷ Standard images when connecting to video terminal

Cables	Reference items
Ⓓ HDMI mini cable (optional)	• Connecting with a HDMI micro cable/ HDMI mini cable (➜ 126) • Playback using VIERA Link (➜ 127)

About the status indicator of the unit

- While the unit is connected to a television, the status indicator lights up in orange.
- While the unit is accessing the SD card or the built-in memory, the status indicator illuminates in red. During access, do not disconnect the HDMI micro cable (HX-WA2)/HDMI mini cable (HX-DC2) or remove the battery.

- Check that the plugs are inserted as far as they go.
- Do not use any other AV cables except the supplied one.
- HX-WA2

 Always use a genuine Panasonic HDMI micro cable (RP-CHEU15: optional).

 HX-DC2

 Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30: optional).

2 Select the video input on the TV.

- Example:

 Select the [HDMI] channel with an HDMI micro cable (HX-WA2)/HDMI mini cable (HX-DC2).

 Select the [Video 2] channel with an AV cable.

 (The name of the channel may differ depending on the connected TV.)

- Check the input setting (input switch) and the audio input setting on the TV. (For more information, please read the operating instructions for the TV.)

3 Play back from the unit

- The volume cannot be adjusted on the unit. Please adjust the volume on the TV.

- HX-WA2

 If the HDMI micro cable and AV cable are connected at the same time, output will be prioritised in order of the HDMI micro cable, AV cable.

 HX-DC2

 If the HDMI mini cable and AV cable are connected at the same time, output will be prioritised in order of the HDMI mini cable, AV cable.

- **About the video output**

 The video output destination varies depending on the status of the unit.

Connection cable	Video output destination	TV SYSTEM (➔ 126)	Recording mode		Playback mode
			Standing by	Recording	
AV cable (supplied)	LCD monitor of the unit	NTSC	—	○	—
		PAL	○		
	TV	NTSC	○	—	○
		PAL	—		
HX-WA2 HDMI micro cable (optional) HX-DC2 HDMI mini cable (optional)	LCD monitor of the unit	NTSC	—	○	—
		PAL			
	TV	NTSC	○	—	○
		PAL			

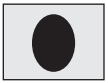
○: Output
—: No output

■ To watch images on a regular TV (4:3) or when both sides of the images do not appear on the screen

Change the menu setting to display the images correctly. (Check the TV setting.)

[MENU]: [SETUP] → [TV OUTPUT] → [TV ASPECT] → [4:3]

Example of images with a [16:9] aspect ratio on a regular TV (4:3)

[TV ASPECT] setting	
[16:9]	**[4:3]**
	

- If a wide-screen TV is connected, adjust the aspect setting on the TV. (Refer to the operating instructions of the TV for details.)

Refer to the following support site for information about Panasonic TVs with an SD card slot for playing back your pictures.
http://panasonic.net/

- For details on how to play back, please read the operating instructions for the TV.

Connecting with a HDMI micro cable/ HDMI mini cable

Select the desired method of HDMI output.

[MENU]: [SETUP]2 → [TV OUTPUT] → [HDMI] → [AUTO]/[720p]/[1080i]/[480p]

- [AUTO] determines the output resolution automatically based on information from the connected TV.
 If the images are not output on the TV when the setting is [AUTO], switch to the method [720p], [1080i] or [480p] which enables the images to be displayed on your TV. (Please read the operating instructions for the TV.)

TV format setting

Set the format of the video signal output from the USB/AV connector.

[MENU]: [SETUP]2 → [TV OUTPUT] → [TV SYSTEM] → [NTSC] or [PAL]

[NTSC]:	Outputs NTSC video signals.
[PAL]:	Outputs PAL video signals.

Playback using VIERA Link

What is the VIERA Link (HDAVI Control™)?

- This function allows you to use your remote control for the Panasonic TV for easy operations when this unit has been connected to a VIERA Link compatible device using a HDMI micro cable (optional)/HDMI mini cable (optional) for automatic linked operations. (Not all operations are possible.)
- VIERA Link is a unique Panasonic function built on a HDMI control function using the standard HDMI CEC (Consumer Electronics Control) specification. Linked operations with HDMI CEC compatible devices made by other companies are not guaranteed.
 When using devices made by other companies that are compatible with VIERA Link, refer to the operating instructions for the respective devices.
- This unit is compatible with VIERA Link Ver.5. VIERA Link Ver.5 is the newest Panasonic version and is also compatible with existing Panasonic VIERA Link devices. (As of Nov 2011)

- **Set to Playback mode. (➜ 41)**

1 Select the menu.

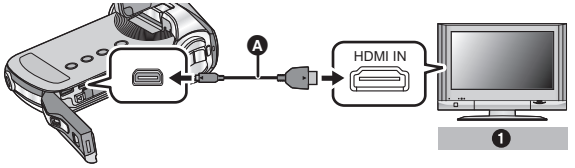
[MENU]: [SETUP] → [TV OUTPUT] → [VIERA Link] → [ON]

- If you are not using VIERA Link, set to [OFF].

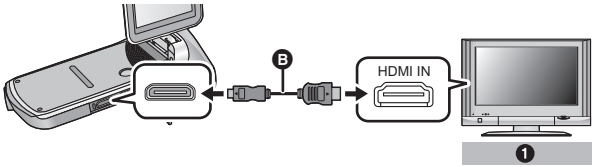
2 Connect this unit to a Panasonic TV compatible with VIERA Link.

- HX-WA2
 Connect with a HDMI micro cable.
- HX-DC2
 Connect with a HDMI mini cable.

HX-WA2



HX-DC2



- **A** HDMI micro cable (optional)
- **B** HDMI mini cable (optional)
- **1** Panasonic TV compatible with VIERA Link

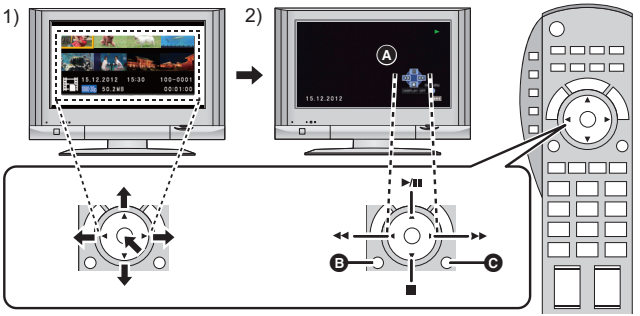
- It is recommended to connect this unit to an HDMI terminal other than the HDMI1 if there are 2 or more HDMI input terminals on the TV.
- VIERA Link must be activated on the connected TV. (Read the operating instructions of the TV for how to set etc.)
- HX-WA2

 Always use a genuine Panasonic HDMI micro cable (RP-CHEU15: optional).

 HX-DC2

 Always use a genuine Panasonic HDMI mini cable (RP-CDHM15, RP-CDHM30: optional).

3 Operate with the remote control for the TV.



1) Press the button up, down, left or right to select a scene or still picture to be played back, and then press the button in the centre to set it.
2) Activate the operation icons that are displayed on TV screen with the remote control for the TV.

Ⓐ Operation icons
Ⓑ Display operation icons
Ⓒ Cancel operation icons

■ Other linked operations

Turning the unit off:

If you use the remote control for the TV to turn off the power, this unit also turns off.

Automatic input switching:

If you connect with a HDMI micro cable (HX-WA2) or a HDMI mini cable (HX-DC2) and then turn on this unit, the input channel on the TV automatically switches to this unit's screen. If the TV's power is in standby status, it will turn on automatically (if [Set] has been selected for the TV's [Power on link] setting).

- Depending on the HDMI terminal on the TV, the input channel may not switch automatically. In this case, use the remote control for the TV to switch the input channel.

- If you are unsure whether or not the TV and AV amplifier you are using are compatible with VIERA Link, read the operating instructions for the devices.
- Available linked operations between this unit and a Panasonic TV is different depending on the types of Panasonic TVs even if they are compatible with VIERA Link. Refer to the operating instructions of the TV for the operations that support on the TV.
- Operation is not possible with a cable that is not based on the HDMI standard.

Copying from Built-in Memory to SD card

Files recorded using the unit can be copied from the built-in memory to an SD card inserted into the unit.

Copying

1 Set to Playback mode. (➜ 41)

- Be sure to use a sufficiently charged battery or the AC adaptor.

2 Select the menu.

[MENU]: [PB2] → [COPY] → desired setting

[COPY SELECTED]:
Copies the selected file to the SD card.

[COPY ALL]:
Copies all files recorded in the built-in memory to the SD card.

3 (On selecting [COPY SELECTED])
Select the file to copy using the SET button and press the SET button.

- ✓ will appear on the selected file. To cancel, press the SET button again.
- You can continue selecting up to maximum of 100 files.
- Press the MENU button to return to the previous step.

(On selecting [COPY ALL])
Select [COPY ALL] to begin copying to the SD card.

4 (On selecting [COPY SELECTED])
Press the recording start/stop button or the [camera] button.

- When the copying ends, the unit returns to the playback menu.

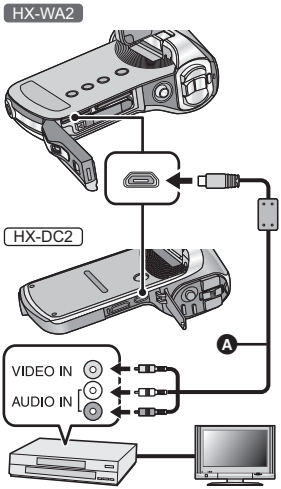
If you intend to delete the original file when the copying has finished, always play back the copied file before deletion to confirm that the original has been copied normally.

- You cannot change the order of the files that are to be copied.

Dubbing images onto other video devices

You can dub by connecting an AV cable.

- Be sure to use a sufficiently charged battery.
- **Images are dubbed in standard quality.**



Change the video input on the video device and TV that this unit is connected to.

- The channel set will differ depending on the terminal to which the unit is connected.
- See the operating instructions of the video device for details.
- Insert the plugs as far as they will go.
- Do not use any other AV cables except the supplied one.

A AV cable (supplied)

- **Set to Playback mode. (➜ 41)**

1 Connect the unit to the recording equipment and begin playback on the unit.

- If the unit is connected to a video device using an AV cable, the screen of the unit will not display images when in playback mode. Check on the TV screen instead.

2 Start recording on the connected device.

- To stop recording (dubbing), stop playback on this unit after stopping recording on the recorder.
- Even when [DISPLAY] is set to [OFF], the battery icon will be displayed if the battery runs low. Be sure to use a battery which has been charged sufficiently.

- If the date and time display and function indication are not wanted, cancel them before dubbing. (➜ 65)

If the dubbed images are played back on a wide-screen TV, the images may be stretched vertically.
In this case, refer to the operating instruction of the device you are connecting to or read the operating instructions of the wide-screen TV and set the aspect ratio to 16:9.

What you can do with a PC

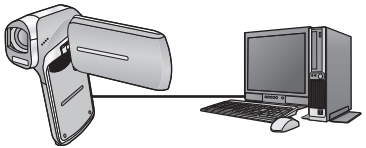
HD Writer VE 2.0

You can copy the motion/still picture data to the HDD of PCs or write to media like Blu-ray discs, DVD discs or SD cards using HD Writer VE 2.0, the software installed in the supplied CD-ROM.
Refer to the operating instructions of HD Writer VE 2.0 (PDF file) for details on how to use it.

- Scenes edited using the HD Writer VE 2.0 can be played back on the unit. Note, however, that such scenes cannot be edited on the unit.

■ Smart wizard

The Smart wizard screen is automatically displayed when you connect this unit to a PC with HD Writer VE 2.0 installed. (➜ 145)





Copy to PC:	You can copy motion/still picture data to the HDD of PCs.
Copy to disc:	You can copy to disc in high definition picture quality or conventional standard picture quality (MPEG2 format).

- Select the function you wish to use and follow the on-screen instructions for easy copying.

Important Notice

- **When using an SDXC Memory Card, check the following support site.**
 http://panasonic.net/avc/sdcard/information/SDXC.html
- **When inserting a disc containing recorded motion pictures into other devices, a message prompting you to format the disc may be displayed. Do not format the disc, since deleted data cannot be restored later.**

What can be done with the HD Writer VE 2.0	Data type
Copying data to a PC	Motion picture and still picture
Copying to a Blu-ray disc ● Motion pictures are converted to high-definition (H.264) motion pictures. ● Motion pictures recorded using iFrame / 480-30p cannot be copied.	
Copying in DVD-Video format: ● Converted to conventional standard quality (MPEG2 format).	Motion picture
Editing: Editing motion picture data copied on an HDD of a PC ● Title, Transition, Delete partially, Dividing ● Converting part of motion picture into still picture	
Online sharing: You can upload motion picture data on the Internet and share them with your family and friends.	
Playing back on a PC: Play back the motion picture data in high definition picture quality on a PC.	

- It is possible to play back still pictures on a PC using a image viewer standard to Windows or commercially available image browsing software, and copy still pictures to a PC using Windows Explorer.
- Please refer to page 152 for details about using a Mac.

- **Data cannot be written to the unit from a PC.**

- **Motion pictures that have been recorded on another device cannot be written to the software supplied with this unit.**
- Audio files cannot be handled.
- When motion picture data is written to and read from the SD card, correct operation cannot be guaranteed with software other than that supplied with the unit.
- Do not start the software supplied with this unit and other software at the same time. Close any other software if you start the software supplied with this unit and close the software supplied with this unit if you start any other software.

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Operating environment

- Even if the system requirements mentioned in these operating instructions are fulfilled, some PCs cannot be used.
- A CD-ROM drive is necessary to install the supplied software applications. (A compatible Blu-ray disc/DVD writer drive and media are necessary for writing to a Blu-ray disc/DVD.)
- Operation is not guaranteed in the following cases.
 - When 2 or more USB devices are connected to a PC, or when devices are connected through USB hubs or by using extension cables.
 - Operation on an upgraded OS.
 - Operation on an OS other than the one pre-installed.
- This software is not compatible with Microsoft Windows 3.1, Windows 95, Windows 98, Windows 98SE, Windows Me, Windows NT and Windows 2000.

■ Operating environment for HD Writer VE 2.0

PC	IBM PC/AT compatible PC
OS	Windows 7 (32 bit/64 bit) Starter/Home Basic/ Home Premium/Professional/Ultimate (SP1) Windows Vista (32 bit) Home Basic/Home Premium/ Business/Ultimate (SP2) Windows XP (32 bit) (SP3)
CPU	Intel Pentium 4 2.8 GHz or higher (including compatible CPU) ● Intel Core 2 Duo 2.16 GHz or higher or AMD Athlon 64 X2 Dual-Core 5200+ or higher is recommended when using the playback function. ● Intel Core 2 Quad 2.6 GHz or higher is recommended when using the editing function. ● Intel Core i7 2.8 GHz or higher is recommended when copying to Blu-ray discs.

RAM	Windows 7: 1 GB or more (32 bit)/2 GB or more (64 bit) Windows Vista: 1 GB or more Windows XP: 512 MB or more (1 GB or more recommended)
Display	High Colour (16 bit) or more (32 bit or more recommended) Desktop resolution of 1024×768 pixels or more (1920×1080 pixels or more recommended) Windows 7/Windows Vista: DirectX 9.0c compatible video card (DirectX 10 recommended) Windows XP: DirectX 9.0c compatible video card Compatible with DirectDraw overlay PCI Express™×16 compatible recommended Video memory of 256 MB or more recommended
Free hard disk drive space	Ultra DMA — 100 or higher Available hard disk capacity of 450 MB or more for installation ● When writing to DVD/Blu-ray disc/SD, at least twice the amount of free disk space as the disc or card being created is necessary.
Sound	DirectSound Support
Interface	USB port [Hi-Speed USB (USB 2.0)]
Other requirements	Mouse or equivalent pointing device Internet connection

- Supplied CD-ROM is available for Windows only.
- Input is not supported in languages other than English, German, French, Simplified Chinese and Russian.
- Operation cannot be guaranteed on all Blu-ray disc/DVD drives.
- Operation is not guaranteed on Microsoft Windows Vista Enterprise, Windows XP Media Center Edition, Tablet PC Edition and Windows 7 Enterprise.
- This software is not compatible with a multi-boot environment.
- This software is not compatible with a multi-monitor environment.

- If using Windows XP, only an administrative account user can use this software. If using Windows Vista/Windows 7, only administrative and standard account users can use this software. (An administrative account user should install and uninstall this software.)

■ To use the HD Writer VE 2.0

You will need a high performance PC depending on the functions to be used. It may not properly play back or properly operate depending on the environment of the PC used. Refer to the operating environment and notes.

- Operation during the playback may become slow if the CPU or memory is not fulfilling the requirements of the operating environment.
- Always use the most current driver for the video card.
- Always make sure there is enough capacity on the HDD in the PC. It may become inoperable or the operation may stop suddenly if the capacity gets low.

■ Operating environment for the card reader function (mass storage)

PC	IBM PC/AT compatible PC
OS	Windows 7 (32 bit/64 bit) or SP1 Windows Vista (32 bit) (SP2) Windows XP (32 bit) (SP3)
CPU	Windows 7/Windows Vista: 1 GHz or higher 32-bit (×86) or 64-bit (×64) processor (including compatible CPU) Windows XP: Intel Pentium III 450 MHz or higher or Intel Celeron 400 MHz or higher
RAM	Windows 7: 1 GB or more (32 bit)/2 GB or more (64 bit) Windows Vista Home Basic: 512 MB or more Windows Vista Home Premium/Business/Ultimate/ Enterprise: 1 GB or more Windows XP: 512 MB or more (1 GB or more recommended)
Interface	USB port
Other requirements	Mouse or equivalent pointing device

- The USB equipment operates with the driver installed as standard in the OS.

Installation

When installing the software, log on to your computer as the Administrator or with a user name with equivalent authorization. (If you do not have authorization to do this, consult your manager.)

- Before starting the installation, close all applications that are running.
- Do not perform any other operations on your PC while the software is being installed.
- Explanation of operations is based on Windows 7.

1 Insert the CD-ROM into the PC.

- The [AutoPlay] screen is displayed automatically. Click [Run setup.exe] → [Yes].
- If Windows 7 is in use, or the [AutoPlay] screen is not displayed automatically, select [Start] → [Computer] (or double-click on [Computer] on the desktop), and then double-click [Panasonic].

2 Click [Yes].

- **Operate following the instruction on the screen.**
- Select [PAL Area] when the country or region of your residency is not displayed in the selection screen for the country or region.

The PC must be rebooted for the application to work.

■ Uninstalling HD Writer VE 2.0

Follow the steps below to uninstall any software applications that you no longer require.

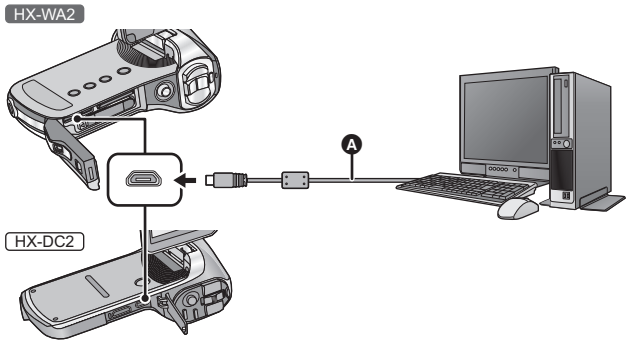
1 Select [Start] → [Control Panel] → [Uninstall a program].

2 Select [HD Writer VE 2.0], then click [Uninstall].

- Proceed with the uninstallation by following the on-screen instructions.
- After uninstalling the software, be sure to reboot the PC.

Connecting to a PC

- Connect this unit to the PC after the software applications are installed.
- Remove the supplied CD-ROM from your PC.



Ⓐ USB cable (supplied)

- Insert the plugs as far as they will go.

1 Turn on the unit.

- Be sure to use a sufficiently charged battery.
- This function is available in all modes.

2 Connect this unit to a PC.

- The USB function selection screen will appear.

3 Select the desired connection mode using the SET button and press the SET button.

[CARD READER]:	The unit works as an external drive for the PC. (Card reader mode) (➜ 146)
[WEB CAMERA]:	The unit works as a web camera. (Web camera mode) (➜ 149)

■ To disconnect USB cable safely

Select the icon in task tray displayed on the PC, and then click [Eject Panasonic Camcorder].

- Depending on your PC's settings, this icon may not be displayed.

About the status indicator of the unit

- While the unit is connected to a PC, the status indicator lights up in green.
- While the unit is accessing the SD card or the built-in memory, the status indicator illuminates in red. During access, do not disconnect the USB cable or remove the battery.

- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.)
- When this unit is connected to a PC using a USB cable while the unit is turned on, power is also supplied from the PC to this unit.
- When performing reading/writing between a PC and an SD card, be aware that some SD card slots built into PCs and some SD card readers are not compatible with the SDHC Memory Card or SDXC Memory Card.
- When using an SDXC Memory Card, check the following support site. **http://panasonic.net/avc/sdcard/information/SDXC.html**

Use as a card reader

Connect the unit to a PC and set the unit to card reader mode. (➜ 145)

- The LCD monitor will turn off.
- The Smart wizard screen is automatically displayed when HD Writer VE 2.0 is installed.
- This unit is automatically recognised as an external drive of the PC. (➜ 147)
- File is read from the SD card if one is inserted or the built-in memory if no SD card is inserted.
- When you select an option other than [CARD READER], reconnect the USB cable.

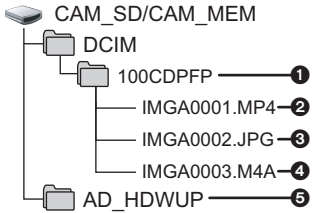
■ About the PC display

When the unit is connected to a PC, it is recognised as an external drive.

- Removable disk (Example: CAM_SD (F:)) is displayed in [Computer].

We recommend using HD Writer VE 2.0 to copy motion picture data.
Using Windows Explorer or other programmes on the PC to copy, move or rename files and folders recorded with this unit will result in them being unusable with HD Writer VE 2.0.
It is impossible to write data to the built-in memory or SD card on this unit from a PC.

Example folder structure in built-in memory/SD card:



The following data will be recorded.

❶ **Up to 999 files of motion pictures/still pictures/audio files can be recorded in a single folder.**
If you record further images/audio, a 101CDPFP folder is created and the files are stored in this new folder. The folders are numbered 102CDPFP, 103CDPFP...and so on.

❷ **Recorded scenes**

❸ **JPEG format pictures**

❹ **Recorded audio**

❺ **(SD card (CAM_SD) only)**
The upload tool (HD Writer Web Uploader) is automatically copied to the SD card when WEB upload setting (➜ 154) is performed.

■ Copying your still pictures to your PC

Card reader function (mass storage)

Still pictures recorded with this unit can be copied to the PC with Explorer or other programmes.

1 Double click the folder that contains the still pictures. ([DCIM] → [100CDPFP] etc.)

2 Drag and drop the still pictures onto the destination folder (on the PC's HDD).

- Do not delete the SD card's folders. Doing so may make the SD card unusable in this unit.
- When data not supported by this unit has been recorded on a PC, it will not be recognised by this unit.
- Always use this unit to format SD cards.

■ Charging the battery by connecting it to different devices

If you turn off the unit and connect it to a PC, Panasonic Blu-ray disc recorder or Panasonic DVD recorder using a USB cable, the battery will charge.

- Insert the USB cable securely all the way. It will not operate properly if it is not inserted all the way.
- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.)
- Be sure to connect the unit directly to the PC, Blu-ray disc recorder or DVD recorder.
- If you do not intend to use the unit for an extended period, disconnect the USB cable from the unit for safety.
- During charging, the status indicator flashes red.
- If the status indicator flashes fast and then goes off or stays off, charging will not be possible. Charge by using the AC adaptor. (➜ 27)
- It will take 2 or 3 times longer to charge compared to when using the AC adaptor.
- If the status indicator flashes at a particularly fast or slow rate, refer to page 177.

Using the unit as a web camera

When the unit is connected to a PC that is connected to the Internet, the unit can be used as a web camera.

	PC	
	IBM PC/AT compatible PC	**Mac**
Necessary software	Windows Live Messenger	iChat
OS	Windows 7 (32 bit/64 bit) or SP1 Windows Vista (32 bit) (SP2) Windows XP (32 bit) (SP3)	Mac OS X 10.7.2
CPU	Windows 7/Windows Vista: 1 GHz or higher 32-bit (×86) or 64-bit (×64) processor (including compatible CPU) Windows XP: Intel Pentium III 450 MHz or higher or Intel Celeron 400 MHz or higher	Intel Core 2 Duo or better
RAM	Windows 7: 1 GB or more (32 bit)/ 2 GB or more (64 bit) Windows Vista Home Basic: 512 MB or more Windows Vista Home Premium/ Business/Ultimate/Enterprise: 1 GB or more Windows XP: 512 MB or more (1 GB or more recommended)	2 GB or more
Interface	USB port	
Other requirements	Mouse or equivalent pointing device	

- Operation cannot be guaranteed on every PC having the recommended environment.
- Not compatible with Microsoft Windows 3.1, Windows 95, Windows 98, Windows 98SE, Windows Me, Windows NT and Windows 2000.
- Operation is not guaranteed in the following cases.
 - Operation on an upgraded OS.
 - Operation on an OS other than the one pre-installed.

1 Connect the unit to a PC and set the unit to web camera mode. (➜ 145)

- The LCD monitor will turn off.
- If you touch anything other than [WEB CAMERA], remove and then reconnect the USB cable.

2 (On the PC) Start Windows Live Messenger or iChat.

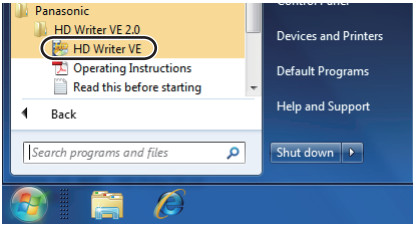
- Check that the unit has been selected in the Windows Live Messenger or iChat settings.
- When disconnecting the USB cable from your PC, please close Windows Live Messenger or iChat before disconnecting.

- After 12 hours, the unit is automatically turned off.
- In web camera mode, the following functions are disabled.
 - [DIGITAL ZOOM], [i.ZOOM], [FACE CHASER], [E.I.S.(VIDEO)] and [E.I.S.(PICTURE)]
- In web camera mode, although the unit can record up to 30 frames per second, this rate may drop due to network conditions and PC processing speed.
- Operation cannot be guaranteed on all devices having a USB terminal.

Starting HD Writer VE 2.0

- To use the software, log on as an Administrator or as user name for standard user account (only for Windows 7/Windows Vista).
 The software cannot be used with the user name for a guest account.

(On the PC)
Select [Start] → [All Programs] → [Panasonic] → [HD Writer VE 2.0] → [HD Writer VE].



- For details on how to use the software applications, read the PDF operating instructions of the software.

Reading the operating instructions of the software applications

- You will need Adobe Acrobat Reader 5.0 or later or Adobe Reader 7.0 or later to read the PDF operating instructions.

Select [Start] → [All Programs] → [Panasonic] → [HD Writer VE 2.0] → [Operating Instructions].

If using Mac

- HD Writer VE 2.0 is not available for Mac.
- iMovie'11 supported. For details about iMovie'11, please contact Apple Inc.

■ Operating environment

PC	Mac
OS	Mac OS X 10.7.2
CPU	Intel Core 2 Duo or better
RAM	2 GB or more
Interface	USB port
Other requirements	Mouse or equivalent pointing device

- Even if the system requirements mentioned in these operating instructions are fulfilled, some PCs cannot be used.
- The USB equipment operates with the driver installed as standard in the OS.
- Supplied CD-ROM is available for Windows only.

■ Copying still pictures on PC

1 Connect this unit to a PC via the supplied USB cable.

- The USB function selection screen will appear.

2 Select [CARD READER] using the SET button on the unit, and press the SET button.

- The LCD monitor will turn off.
- This unit is automatically recognised as an external drive of Mac.
- If you select anything other than [CARD READER], remove and then reconnect the USB cable.

3 Double click on the [CAM_SD] or [CAM_MEM] displayed on the desktop.

- Files are stored in [100CDPFP] folder etc. in the [DCIM] folder.

4 Using a drag-and-drop operation, move the pictures you want to acquire or the folder storing those pictures to any different folder on the PC.

■ To disconnect USB cable safely

Drag [CAM_SD] or [CAM_MEM] disk icon to the [Trash], and then disconnect the USB cable.

- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.)

Uploading files to a web service

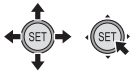
When you connect the unit to a PC that is connected to the Internet, you can easily upload files recorded on the SD card to YouTube or Facebook.

- **Insert the SD card.**
- **Set to Playback mode. (➜ 41)**

1 Select the menu.

[MENU]: [PLAY] 2 → [UPLOAD SET] → [SELECT]

2 Select the file to upload using the SET button and press the SET button.



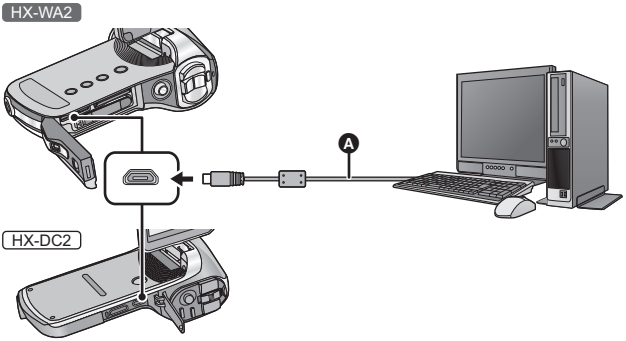


- will appear on the selected file. To cancel, press the SET button again.
- You can continue selecting up to maximum of 20 files.
- Copy files recorded to the built-in memory to the SD card before configuring the settings.
- On configuring the settings, the upload tool built into the unit (HD Writer Web Uploader) is automatically copied to the SD card.

3 Press the recording start/stop button or the button.

- To cancel all selections, press the MENU button, select [CANCEL ALL], and press the SET button.

4 Connect the unit to the PC using the USB cable.



Ⓐ USB cable (supplied)

- Insert the plugs as far as they will go.
- Do not use any other USB cables except the supplied one. (Operation is not guaranteed with any other USB cables.)
- Removable disk (Example: CAM_SD (F:)) is displayed in [Computer].

5 Select [CARD READER] using the SET button and press the SET button.

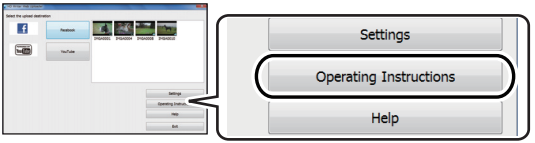
6 Open the removable disk that appears in [Computer].

7 Double-click [HDWWEBUP.EXE] in the [AD_HDWUP] folder.

- The HD Writer Web Uploader will start.

8 Select an upload destination.

- For subsequent operations, please read the operating instructions (PDF) of the HD Writer Web Uploader.



- You will need Adobe Acrobat Reader 5.0 or later or Adobe Reader 7.0 or later to read the PDF operating instructions.

- Audio files cannot be handled.
- When using the Eye-Fi card, the web upload function is disabled.
- Operation cannot be guaranteed on future YouTube and Facebook services and updates. The service content and screens which can be used are subject to change without prior notice. (The service is currently available (January 1st 2012))
- Do not upload images protected by copyright unless you hold the copyright or you have obtained permission from the relevant copyright holder.

Using the Eye-Fi™ transfer feature

By using the Eye-Fi card, you can save files recorded on a card to a PC or file-sharing site via a wireless network.

- The functions of the Eye-Fi card (including wireless transmission) are not guaranteed to work on this product. In the case of a malfunction of the card, please contact the card manufacturer.
- To use the Eye-Fi transfer feature, a broadband wireless LAN environment is required.
- To use the Eye-Fi card, permission from the national or regional government is required. Do not use if you have not obtained permission. If you are unsure as to whether use is permitted, please check with the card manufacturer.
- **Install the software supplied with the Eye-Fi card in advance on your PC, and configure the Eye-Fi settings. (For settings methods etc., please read the card operating instructions or consult the card manufacturer)**

Select the menu.

[MENU]: [3] → [Eye-Fi] → [TRANSFER] → [ON]

- When [TRANSFER] is set to [ON], the transferrable files will be transferred automatically.
- To cancel the forwarding of a file, turn off the unit or set [TRANSFER] to [OFF].
- The setting at the time of purchase is [OFF]. Every time the Eye-Fi card is removed from the unit, this setting is set to [OFF].
- You can check the transfer of the file on the thumbnail screen (8-file display).

	File has been transferred
	File waiting for transfer
	File cannot be transferred

■ Using direct mode

The files can be transferred directly from the Eye-Fi card to a smartphone or tablet without going through the access point when necessary setting is performed in a PC in advance.

- **Install the software supplied with the Eye-Fi card on your PC, and configure the direct mode settings.**

Select the menu.

[MENU]: [Setup 3] → [Eye-Fi] → [START DIRECT MODE]

- If any of the following operations is performed, the direct mode will be cancelled.
 - If you turn the unit off
 - Closing the LCD monitor, sending the unit into standby mode.
 - Starting motion picture or audio recording

The direct mode may be cancelled by the Eye-Fi card for reasons other than the above.

- In direct mode, the economy mode function (➜ 39) is disabled.
- When [TRANSFER] (➜ 157) is set to [OFF], [START DIRECT MODE] cannot be selected.

■ Selecting files to transfer

If you perform the required settings in advance on your PC, you can transfer selected files alone. For settings methods etc., please read the card operating instructions or consult the card manufacturer.

- **Install the software supplied with the Eye-Fi card on your PC, and configure the selection transfer settings.**

Select the menu.

[MENU]: [Playback 1] → [TRANSFER/PROTECT]

- The settings method is the same as for the protect settings. (➜ 120)
- For the files set for selected transfer, [O-key] is displayed on the thumbnail screen (1-file display).
- If you have not performed selected transfer settings on your PC, [PROTECT] is displayed and the selection transfer setting is disabled.

- When the write protect switch on the Eye-Fi card is on the LOCK side, [PROTECT] is displayed and selected transfer setting is disabled. Please unlock the write protect switch.
- The protect setting is also applied to the files for which [TRANSFER/PROTECT] is set. To delete or rotate a file, first cancel [TRANSFER/PROTECT] and then perform the operation.

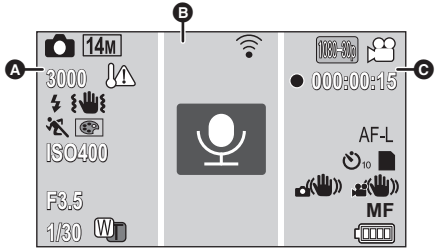
- The [Eye-Fi] menu only appears when an Eye-Fi card is used.
- The Eye-Fi transfer feature cannot be guaranteed to continue to operate in the future due to changes to the card specification etc.
- Update the firmware of the Eye-Fi card to the latest one using the software supplied with the Eye-Fi card before use.
- Eye-Fi transfer is terminated when it goes into sleep mode by the energy-saving function during the Eye-Fi transfer. Connect the AC adapter and set the [AC:REC/PLAY] in [ECONOMY] to [60 min]. (➜ 65) (Energy-save function will disabled during the direct mode.)
- When the endless memory function of the Eye-Fi card is set to on, the files transferred from the card may be deleted automatically.
- The Eye-Fi card may heat up as a result of the files being transferred.
- When the Eye-Fi card is used, the battery will run down faster.
- Audio files cannot be handled.
- The [Eye-Fi] setting can be checked from the recording standby screen or the thumbnail screen (1-file display).

	**In [Eye-Fi], [TRANSFER] is set to [ON] (Transferring in direct mode)**
	**In [Eye-Fi], [TRANSFER] is set to [ON]**
	**In [Eye-Fi], [TRANSFER] is set to [OFF]**

- When using the Eye-Fi card, please be sure to unlock the write-protect switch. (➜ 33)
- Files cannot be transferred during motion picture recording or audio recording.
- Before deleting the files, please confirm they have been transferred to your PC and uploaded to the sharing site.
- Do not use the Eye-Fi card in locations where the use of wireless devices is forbidden, such as inside aircraft etc.
- Depending on network conditions, the transfer may take some time. Also, if network conditions deteriorate, the transfer may be suspended.
- Files over 2 GB in size cannot be transferred. Such files should first be split to reduce the file size. (➜ 113)

LCD Display Indications

■ Recording indications



A	
(White)	Still picture recording icon
(Red)	Recording still picture
	During burst recording (➜ 75)

14M / 10M / 5M / 3M / 0.3M / 10M / 7,8M / 3,5M / 2M

Number of recording pixels for still pictures (➜ 82, 104)

In Playback Mode, the picture size is not displayed for still pictures recorded with other products that have different picture sizes from the sizes shown above.

14M / 14M / 3M / 3M	Burst recording (➜ 75)
/	Panorama recording (➜ 77)
3000	Remaining number of still pictures (➜ 50)
	High temperature warning (➜ 40)
ϟA/ϟ/	Flash (➜ 86)
	Camera shake warning (➜ 51)

/ / / / / / / / / / / / /*/

Scene Mode (➜ 82)

* HX-WA2 only

/ / / / / /

Colour mode (➜ 90)

ISO50/ISO100/ISO200/ISO400/ISO800/ISO1600

ISO sensitivity (➜ 91)

/ / / / / / / / /

Intelligent Auto Mode (➜ 55)

F3.5	Iris value (➜ 50)
1/30	Shutter Speed (➜ 50)
/	Zoom/Double range zoom (➜ 72)

B

/ /	Eye-Fi settings (➜ 159)
(Grey) **(Red)**	Audio recording icon Recording audio
+	Focus mark (➜ 88)
□	Spot metering target (➜ 89)

1080-60i / 1080-30p / 720-60p / 720-30p / iFrame / 480-30p	Recording Mode (➜ 81)
(White) **(Red)**	Motion picture recording icon Recording motion picture
● **(Red)**	Recording motion picture (➜ 47) Recording audio (➜ 54)
000:00:15	Recording time elapsed (➜ 47, 54) Approximate remaining recordable time (➜ 47, 54)
AF-L	AF Lock (➜ 95)
AE-L	AE Lock (➜ 95)
10/2	Self-timer Recording (➜ 87)
	Card recording possible status
	Built-in memory recording possible status
/ /	Image Stabiliser (➜ 74)
/MF/	Focus (➜ 101)
	Remaining battery power (➜ 30)

■ Playback indications

►/❚❚/►►/◄◄/▮►/◄▮	Display during playback (➜ 59, 102)
00:00:30	Playback Time (Motion picture)
000:00:30	Playback Time (Audio)
15. 12. 2012 15:30	Recording date and time
15. 12. 2012	Recording date
100-0001	Folder/file name
	Motion picture file
♪	Audio file

	Files for which selected transfer/protect is set (➜ 120, 158)
	Face detection (➜ 92)
/	Panorama still picture (➜ 77)
/ /	Eye-Fi transfer status (➜ 157)
/	Files exceeding 4 GB in size (➜ 61)
	Remaining battery power (➜ 30)
	Files which cannot be played back

■ Confirmatory indications

––.––.–––– –:–– **(Time display)**	The built-in battery is low. (➜ 43)
	Non-compatible SD card is used.

Messages

Major confirmation/error messages to be indicated on the screen in text.

CHECK CARD.
This card is not compatible or it cannot be recognised by the unit. If this indication appears despite motion pictures, still pictures and audio being recorded on the SD card, the SD card may be in an unstable state. Re-insert the SD card and turn the unit off and on again.
CARD FULL. **Built-in Memory full.**
There is no space on the SD card or in built-in memory. Please delete unneeded files or use an SD card with space on it.
Card is protected
The write protection switch on the SD card is in the LOCK position. Please unlock the write protect switch. (➜ 33)

Troubleshooting

■ **It is not a malfunction in following cases**

Object seems to be warped.	● Object seems to be warped slightly when the object moves across the image very fast, but this is because the unit is using MOS for the image sensor. This is not a malfunction.

White round spots like soap bubbles appear on the recorded picture.	● If you take a picture with the flash in a dark place or indoors, white round spots may appear on the picture caused by the flash reflecting of particles of dust in the air. This is not a malfunction. A characteristic of this is that the number of round spots and their position differ in every picture. 
Why does the displayed image contain some red, blue and green dots, or why are black spots visible.	● Condition due to the LCD monitor characteristics. Not a malfunction. Spots only appear in the LCD monitor and will not be recorded with the images.

Power	
Problem	**Check points**
This unit cannot be turned on. **This unit does not stay on long enough.** **Battery runs down quickly.**	● Recharge the battery pack or connect the AC adaptor. (➜ 27) ● In cold places, the battery using time becomes shorter. ● It is possible to insert the battery incorrectly, so please pay particular attention when inserting that it is correctly oriented.
The battery does not charge. **The battery does not stop charging.**	● Check that the plug portion of the AC adaptor is not loose or misaligned.

Power	
Problem	**Check points**
This unit is turned off automatically.	● To prevent battery consumption due to forgetting to turn the unit off etc., the economy mode function works to send the unit into sleep mode if the unit has been on for approximately 5 minutes (default setting) without an operation being performed. When the unit is in sleep mode, you can turn on the unit by pressing any of the buttons on the unit. ● If the unit turns off when you turn off the power to the TV using the TV remote control, the VIERA Link is at work. If you are not using the VIERA Link, set [VIERA Link] to [OFF]. (➜ 127)
This unit cannot be operated though it is turned on. **This unit does not operate normally.**	● Remove the battery or AC adaptor, wait about 1 minute and then reconnect the battery or AC adaptor. Then about 1 minute later, turn on the unit again. (Conducting the above operation while the media is being accessed may damage the data on the media.) ● If normal operation is still not restored, detach the power connected, and consult the dealer who you purchased this unit from.
A blinking high temperature warning icon is shown, and the unit does not turn on.	● The battery temperature or unit internal temperature (excluding battery) rises. Wait for the temperature to drop before using the unit again.

Power	
Problem	**Check points**
“ERROR OCCURRED. PLEASE TURN UNIT OFF, THEN TURN ON AGAIN.” is displayed.	● Check each of the following items. – Remove the SD card from the device and reinsert. – Remove the battery and then put it in again. – Change the SD card and check. ● If a message is still displayed after checking the above, detach the power connected, and consult the dealer who you purchased this unit from.

Indication	
Problem	**Check points**
The battery capacity indication or the elapsed time indication is not shown.	● [DISPLAY] is [OFF]. (➜ 65)

Status indicator	
Problem	**Check points**
The status indicator is flashing red.	● During battery charging, the status indicator flashes red with a period of approximately 2 seconds (approximately 1 second on, 1 second off). When charging ends, the status indicator turns off. This is not a fault.

Recording	
Problem	**Check points**
The high temperature warning icon is displayed and recording is not possible.	● The battery temperature or unit internal temperature (excluding battery) rises. Wait for the temperature to drop before using the unit again.
When recording still pictures, the angle of view of the image displayed on the LCD monitor changes.	● The field of view of the image displayed on the LCD monitor differs for motion picture recording and still picture recording. At time of purchase, the recording standby screen shows video view. Press the button halfway to change to photo view. To change the angle of view of the recording standby screen to photo view, set [PHOTO VIEW] to (ON). (➜ 97)
The unit arbitrarily stops recording.	● Use an SD card that can be used for motion picture recording. (➜ 32) ● The recordable time may have shortened due to the deterioration of the data writing speed or repeated recording and deletion. Using the unit, format the SD card or built-in memory. (➜ 66)
Image not in focus	● Close and then re-open the LCD monitor. Alternatively, turn the unit off and then on again. When [FOCUS] is set to MF (MANUAL), do the above, then reconfigure the manual focus.
There is noise in the recording image.	● When the [ISO] setting is too high, noise may appear in the recorded images. Please lower the ISO sensitivity setting. (➜ 91)

Recording	
Problem	**Check points**
Colour balance of images is strange when recording in a place such as a gymnasium.	● In a place with multiple light sources, such as a gymnasium or a hall, set the White Balance setting to (INDOOR 2). If you cannot record clearly with the (INDOOR 2), set it to (WHITE SET). (➜ 99)
Colour or brightness of the image changes, or you may see horizontal bars in the image. **The LCD monitor flickers indoors.**	● Colour or brightness of the image may change, or you may see horizontal bars in the image when the object is recorded under fluorescent light, mercury light or sodium light, etc., but this is not a malfunction. ● Record in Intelligent Auto Mode.

Playback	
Problem	**Check points**
Files cannot be played back.	● Any files where the thumbnails display are displayed as [!] cannot be played back.
Files cannot be deleted.	● Release the protect setting. (When using the Eye-Fi card, the protect setting is simultaneously set for files for which selected transfer is set.) (➜ 120, 158) ● Any files where the thumbnails are displayed as [!] cannot be deleted. If the files are unnecessary, format the media to erase the data. (➜ 66) Please be aware that if a media is formatted then all the data recorded on the media is erased and cannot be recovered. Back up important data on a PC, disc etc.

Playback	
Problem	**Check points**
Editing such as rotation of the files is not possible.	● Release the protect setting. (When using the Eye-Fi card, the protect setting is simultaneously set for files for which selected transfer is set.) (➜ 120, 158)
During playback, there is no sound.	● Adjust the play volume in this unit. (➜ 60)

With other products	
Problem	**Check points**
Video or audio is not output even though it is connected to TV correctly. **The images are squeezed horizontally.**	● Please read the operating instructions of your TV and select the channel that matches the input used for the connection. ● Change the [TV ASPECT] setting to match the aspect ratio of the TV. (➜ 125) ● When connecting with the HDMI micro cable (HX-WA2) or the HDMI mini cable (HX-DC2), change the [HDMI] setting. (➜ 126) ● Depending on the status of the unit and the connecting cable, a picture may not appear on the TV or LCD monitor. Check the status of the unit and the connection. (➜ 124)
If the SD card is inserted in another device, it is not recognised.	● Check that the device is compatible with the capacity or type of SD card (SD Memory Card/SDHC Memory Card/SDXC Memory Card) that you inserted. Refer to the operating instructions of the device for details.

With other products	
Problem	**Check points**
VIERA Link does not work.	(Setting on this unit) ● HX-WA2 Connect with a HDMI micro cable (optional). (➜ 127) HX-DC2 Connect with a HDMI mini cable (optional). (➜ 127) ● Set [VIERA Link] to [ON]. (➜ 127) ● Turn the unit off and then back on again. (Setting on other devices) ● If the TV input does not switch automatically, switch the input using the TV remote control. ● Check the VIERA Link setting on the connected device. ● Please refer to the operating instructions of the connected device.

With a PC	
Problem	**Check points**
An error message may appear on the PC when you charge the battery by connecting the USB cable to a PC.	● First disconnect the USB connection cable, then turn on the unit and reconnect. The unit will be recognised by the PC. To charge the battery, first safely disconnect the USB cable and turn off the unit. Then reconnect the USB cable.
When connected by the USB cable, this unit is not detected by the PC.	● After re-inserting the SD card into the unit, reconnect the supplied USB cable. ● Select another USB terminal on the PC. ● Check the operating environment. (➜ 140, 152) ● Connect the supplied USB cable again after restarting the PC and turning on this unit again.

With a PC	
Problem	**Check points**
When the USB cable is disconnected, an error message will appear on the PC.	● To disconnect the USB cable safely, double-click the  icon in the task tray and follow the instructions on the screen.
Cannot see the PDF operating instructions for HD Writer VE 2.0 or HD Writer Web Uploader.	● You will need Adobe Acrobat Reader 5.0 or later or Adobe Reader 7.0 or later to read the PDF operating instructions for HD Writer VE 2.0 or HD Writer Web Uploader.

Others	
Problem	**Check points**
If the SD card is inserted in this unit, it is not recognised.	● If the SD card is formatted on a PC, it may not be recognised by this unit. Use this unit to format SD cards. (➜ 66)

Cautions for use

About this unit

The unit and the SD card become warm during use. This is not a malfunction.

Keep this unit as far away as possible from electromagnetic equipment (such as microwave ovens, TVs, video games etc.).

- If you use this unit on top of or near a TV, the pictures and/or sound on this unit may be disrupted by electromagnetic wave radiation.
- Do not use this unit near cell phones because doing so may result in noise adversely affecting the pictures and/or sound.
- Recorded data may be damaged, or pictures may be distorted, by strong magnetic fields created by speakers or large motors.
- Electromagnetic wave radiation generated by microprocessors may adversely affect this unit, disturbing the pictures and/or sound.
- If this unit is adversely affected by electromagnetic equipment and stops functioning properly, turn this unit off and remove the battery or disconnect AC adaptor. Then reinsert the battery or reconnect AC adaptor and turn this unit on.

Do not use this unit near radio transmitters or high-voltage lines.

- If you record near radio transmitters or high-voltage lines, the recorded pictures and/or sound may be adversely affected.

Make sure to use the supplied cords and cables. If you use optional accessories, use the cords and the cables supplied with them.
Do not extend the cords and the cables.

Do not spray insecticides or volatile chemicals onto the unit.

- If the unit is sprayed with such chemicals, its body may be marred and the surface finish may peel off.
- Do not leave rubber or plastic products in contact with the unit for a long time.

When you use the unit in a sandy or dusty place such as a beach, do not let sand or fine dust get into the body and terminals of the unit.

- Sand or dust may damage the unit. (Care should be taken when inserting and removing a card.)

(HX-DC2)

Keep the unit away from sea water.

- If sea water splashes onto the unit, wipe off the water with a well wrung cloth. Then wipe the unit again with a dry cloth.

When carrying the unit, do not drop or bump it.

- A strong impact can break the unit's casing, causing it to malfunction.

Cleaning

- Before cleaning, detach the battery or pull the AC adaptor from the AC outlet, and then wipe the unit with a soft, dry cloth.
- If the unit is very dirty, dip a cloth in water and squeeze firmly, and then wipe the unit with the damp cloth. Next, dry the unit with a dry cloth.
- Use of benzine, paint thinner, alcohol, or dishwashing liquid may alter the camera body or peel the surface finish. Do not use these solvents.
- When using a chemical dust cloth, follow the instructions that came with the cloth.

Do not use the unit for surveillance purposes or other business uses.

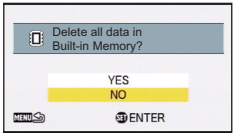
- This unit was designed for consumer intermittent use. It was not intended for continuous use, or for any industrial or commercial application resulting in prolonged use.
- In certain situations, continuous use could cause the unit to overheat and cause a malfunction. Such use is strongly discouraged.

When you are not going to use the unit for an extended time

- When storing the unit in a cupboard, it is recommended that you place a desiccant (silica gel) in with it.

When disposing of or giving away this unit, note that:

- When the built-in memory undergoes [FORMAT], the file management information is changed but not all of the data in the built-in memory is deleted. It may be possible to recover the data using commercially available data-recovery software.
- When disposing of/giving away the unit, we recommend that you physically format the built-in memory of the unit.
 To perform a physical format, connect the unit to the AC adaptor, remove the card, select [FORMAT] → [DELETE DATA] from the option menu 2 and follow the on-screen instructions.



- Please look after the data in your built-in memory carefully. Panasonic will not be held responsible in the unlikely case that private data is divulged.

About the battery

The battery used in this unit is a rechargeable lithium-ion battery. It is susceptible to humidity and temperature and the effect increases the more the temperature rises or falls. In cold areas, the full charge indication may not appear or the low battery indication may appear about 5 minutes after starting use. At high temperatures, the protection function may be triggered, making it impossible to use the unit.

Be sure to detach the battery after use.

- If the battery is left attached, a minute amount of current continues to flow even if the unit is off. Keeping the unit in this state may result in over discharge of the battery. This may result in you not being able to use the battery even after it is charged.
- The battery should be stored in the vinyl bag so metal does not come into contact with the terminals.
- The battery should be stored in a cool place free from humidity, with as constant temperature as possible. (Recommended temperature: 15 °C to 25 °C, Recommended humidity: 40%RH to 60%RH)
- Extremely high temperatures or low temperatures will shorten the life of the battery.
- Do not contaminate the terminal portion of the battery attachment portion or the battery terminals.
- If the battery is kept in high-temperature, high-humidity, or oily-smoky places, the terminals may rust and cause malfunctions.
- To store the battery for a long period of time, we recommend you charge it once every year and store it again after you have completely used up the charged capacity.
- Dust and other matter attached to the battery terminals should be removed.
- Do not remove the external labels and this may result in a malfunction of the unit.

Prepare spare batteries when going out for recording.

- Prepare batteries enough to last for 3 to 4 times the period you are planning to record for. Cold places such as a ski resort can shorten recording time.

If you drop the battery accidentally, check to see if the terminals are damaged.

- Inserting a battery with damaged terminals can damage the unit.

Do not throw old battery into fire.

- Heating a battery or throwing it into a fire may result in an explosion.

If the operating time is very short even after the battery has been recharged, the battery has worn out. Please purchase a new battery.

About the AC adaptor

- If the temperature of the battery is extremely high or extremely low, charging may take time or the battery may not be charged.
- If you use the AC adaptor near a radio, radio reception may be disturbed. Keep the AC adaptor 1 m or more away from the radio.
- When using the AC adaptor, it may generate whirring sounds. However, this is normal.
- After use, be sure to disconnect the AC adaptor. (If you leave this unit connected, the AC adaptor will consume approximately 0.2 W of current.)
- Always keep the electrodes of the AC adaptor clean.

About status indicator during charging

When the status indicator is flashing at a particularly fast or slow rate, the following should be considered.

Flashing with approx. 4 second period (off for approx. 2 seconds, on for approx. 2 seconds):

- When the battery is over discharged or the temperature of the battery is too high or low. It can be charged, but it may take a few hours to complete the charging normally.
- It will flash in approx. 2 second intervals when normal charging resumes. Even in such cases, it may start flashing in approx. 4 second intervals until charging is completed depending on the conditions of use.

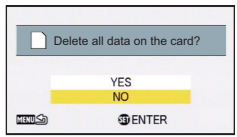
Flashing with approx. 0.5 second period (off for approx. 0.25 second, on for approx. 0.25 second):

- The battery is not charged. Remove the battery from the unit, and try charging again.
- Check that the terminals of the unit or battery are not dirty or covered with a foreign object, and connect the battery correctly once again. If a foreign object or dirt is present, turn off the unit before removing.
- The battery or environment is at an extremely high or low temperature. Wait until the temperature has returned to an appropriate level and try charging again. If you are still unable to charge, there may be a fault in the unit, battery or AC adaptor.

Off:
- Charging has finished.
- If the status indicator stays off despite the charging being unfinished, there may be a fault in the unit, battery or AC adaptor. Refer to page 176 for details on the battery.

About the SD card

When disposing of or giving away the SD card, note that:
- Formatting and deletion of this unit or computer only changes the file management information and does not completely delete the data in the SD card.
- It is recommended that the SD card is physically destroyed or the SD card is physically formatted using this unit when disposing of or giving away the SD card. To perform a physical format, connect the unit to the AC adaptor, insert the SD card, select [FORMAT] → [DELETE DATA] from the option menu 2 and follow the on-screen instructions.



- The customer is responsible for the management of the data in the SD card.

LCD monitor

- When the LCD monitor gets dirty, wipe it with a soft cloth, such as eye glass cleaner.
- In a place with drastic temperature changes, condensation may form on the LCD monitor. Wipe it with a soft cloth, such as eye glass cleaner.
- When the unit has become very cold, for example due to storage in a cold area, its LCD monitor will be slightly darker than usual immediately after the unit is turned on. The normal brightness will be restored when the unit's internal temperature rises.

Extremely high precision technology is employed to produce the LCD Monitor screen featuring a total of approximately 230,000 dots. The result is more than 99.99% effective dots with a mere 0.01% of the dots inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

About copyright

■ Carefully observe copyright laws

Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

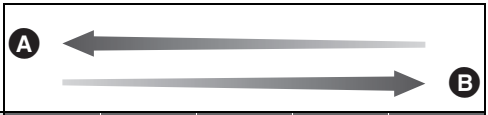
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Recording modes/approximate recordable time

- SD cards are only mentioned with their main memory size. The stated times are the approximate recordable times for continuous recording.



Recording mode		1080-60i *1	1080-30p *1	720-60p *1	720-30p *1	480-30p *2
Picture size		1920×1080	1920×1080	1280×720	1280×720	640×480
SD card	4 GB	20 min	30 min	30 min	50 min	2 h 20 min
	16 GB	1 h 50 min	2 h 10 min	2 h 10 min	3 h 30 min	9 h 50 min
	64 GB	7 h	8 h 20 min	7 h 50 min	13 h 20 min	32 h
Built-in memory	Approx. 64 MB	15 s	20 s	20 s	40 s	2 min

A Favours image quality
B Favours recording time
*1 High-definition image quality
*2 Conventional standard image quality

Recording mode		iFrame *3	
Picture size		960×540	VOICE RECORD
SD card	4 GB	20 min	31 h
	16 GB	1 h 20 min	128 h
	64 GB	5 h 20 min	512 h
Built-in memory	Approx. 64 MB	10 s	30 min

*3 Please use when playing back/editing on a Mac.

- If recording for long periods, prepare batteries for 3 or 4 times the period you wish to record for. (➜ 29)
- The default setting is 1080/30p mode.
- Recording a quickly moving subject or recording a number of short scenes may shorten the recordable time.
- When the [REC MODE] is set to (VOICE RECORD), the file is saved after approximately 5 hours of recording, and the audio recording ends. With other recording mode setting, the unit saves the file and saves the continuation in a new file when the file size exceeds 4 GB during recording. (A new file is created automatically every 4 GB. The recording state is continued until the unit enters the paused state.)
- Use time in the row of 4 GB in above table as a guideline for the time that can be copied onto one DVD disc (4.7 GB).

Approximate number of recordable pictures

- SD cards are only mentioned with their main memory size. The stated number is the approximate number of recordable pictures.

Picture size		14M 4352×3264	10M 3744×2808	5M 2560×1920
Aspect ratio		4:3	4:3	4:3
SD card	4 GB	500	700	1400
	16 GB	2100	2900	6000
	64 GB	8500	11500	23000
Built-in memory	Approx. 64 MB	5	10	25

Picture size		3M 2048×1536	0.3M 640×480
Aspect ratio		4:3	4:3
SD card	4 GB	2300	16500
	16 GB	9000	67000
	64 GB	36000	237000
Built-in memory	Approx. 64 MB	40	250

Picture size		10M 4352×2448	7.8M 3744×2106	3.5M 2560×1440	2M 1920×1080
Aspect ratio		16:9	16:9	16:9	16:9
SD card	4 GB	650	900	1900	3400
	16 GB	2800	3800	7500	13500
	64 GB	11000	15000	31000	52000
Built-in memory	Approx. 64 MB	10	15	30	50

Picture size		(360° PANORAMA)		(180° PANORAMA)	
		14400×720	1280×14400	7200×720	1280×7200
Aspect ratio		–		–	
SD card	4 GB	400		800	
	16 GB	1600		3300	
	64 GB	6500		13000	
Built-in memory	Approx. 64 MB	5		10	

- The memory capacity indicated on the label of an SD card is the total of the capacity for copyright protection and management and the capacity which can be used on the unit, a PC etc.

Panasonic Corporation
Web site: http://panasonic.net